

80 CM LINE SOURCE AT 45 DEGREES, AND 100 CM

Date: October 10, 2000

ISOCSS Version: v4.0

The source consist of one Aluminum tube 813mm long by 9.53mm OD and 0.89mm thick walls.

The activity is uniformly distributed in an epoxy matrix.

The rod is positioned vertically upright. The detector is centered along the length of the rod.

ISOCSS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (SIN 3578) New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.089	0.775	80.9			Al	2.7	
(2) Src. Top Lay.	80.9					Epoxy	1.07	1
(3) Src. Bot. Lay								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	100	0	0	100	0			

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

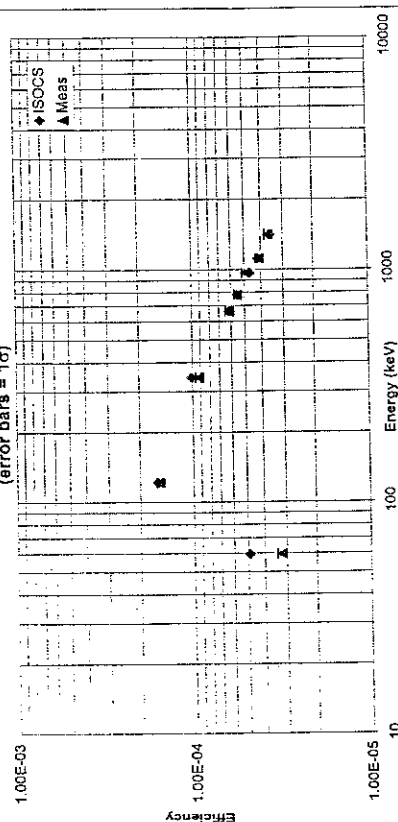
Source Material: 72.1%C+21.9%O+6%H

Comparison Results

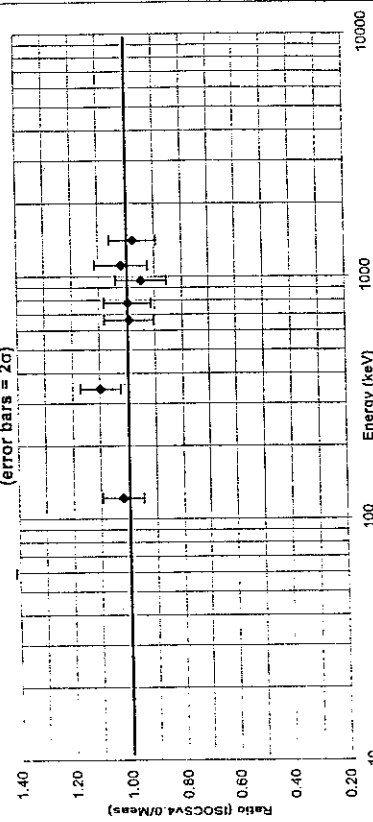
Energy (keV)	ISOCSS efficiency	Measured			Ratio (ISOCSS/Meas)
		efficiency	1 σ unc.	2 σ rel. unc.	
59.54	4.92E-05	3.22E-05	1.83E-06	1.14E-01	1.53
121.78	1.58E-04	1.55E-04	5.67E-06	7.32E-02	1.02
344.28	1.01E-04	9.23E-05	3.37E-06	7.30E-02	1.10
661.66	6.12E-05	6.16E-05	2.72E-06	8.83E-02	0.99
778.9	5.52E-05	5.53E-05	2.32E-06	8.39E-02	1.00
964.13	4.70E-05	4.95E-05	2.25E-06	9.09E-02	0.95
1112.12	4.20E-05	4.12E-05	1.95E-06	9.47E-02	1.02
1408.01	3.57E-05	3.65E-05	1.53E-06	8.38E-02	0.98

Dataset	Wt. Mean		Isocs	
	Ratio	Std. Dev.	Ratio	Std. Dev.
<150keV	1.10	0.24	0.24	0.23
>150keV	1.01	0.05	0.05	0.03
All	1.03	0.11	0.11	0.10

LINE SOURCE AT 45D AND 100CM

(error bars = 1 σ)

LINE SOURCE AT 45D AND 100CM

(error bars = 2 σ)

80 CM LINE SOURCE AT 45 DEGREES, AND 300 CM

Date: October 10, 2000 ISOCS Version: v4.0

The source consist of one Aluminum tube 813mm long by 9.53mm OD and 0.89mm thick walls.
The activity is uniformly distributed in an epoxy matrix.
The rod is positioned vertically upright. The detector is centered along the length of the rod.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (S/N 3578)

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.089	0.775	80.9			Al	2.7	
(2) Src. Top Lay.	80.9					Epoxy	1.07	1
(3) Src. Bot. Lay								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	300	0	0	300	0			

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: H19_C18_O3

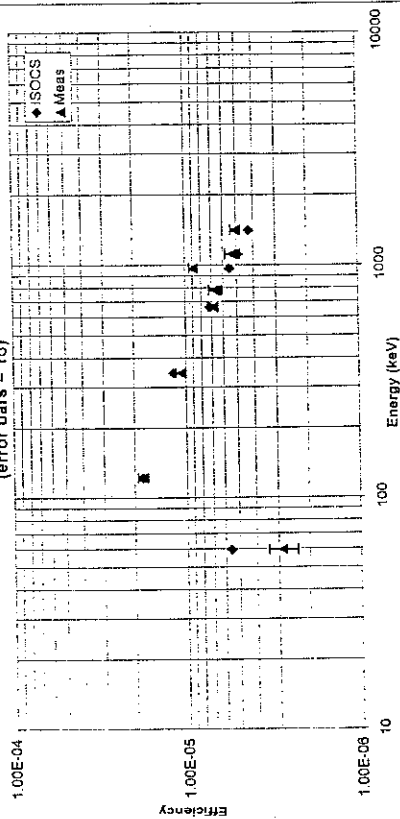
Comparison Results

Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)
59.54	5.61E-06	2.86E-06	5.38E-07	3.76E-01	1.96
121.78	1.80E-05	1.80E-05	1.16E-06	1.29E-01	1.00
344.28	1.18E-05	1.07E-05	6.83E-07	1.28E-01	1.10
661.66	7.24E-06	6.92E-06	4.53E-07	1.31E-01	1.05
778.9	6.48E-06	6.69E-06	5.54E-07	1.66E-01	0.97
964.13	5.60E-06	8.94E-06	5.13E-07	1.15E-01	0.61
1112.12	4.92E-06	5.31E-06	5.18E-07	1.95E-01	0.93
1408.01	4.27E-06	5.08E-06	3.08E-07	1.21E-01	0.84

Dataset	Wt. Mean Ratio	Wt. Rel. Std. Dev.	ISOCS Std. Dev.
<150keV	1.03	0.22	0.21
>150keV	0.81	0.25	0.24
All	0.84	0.25	0.24

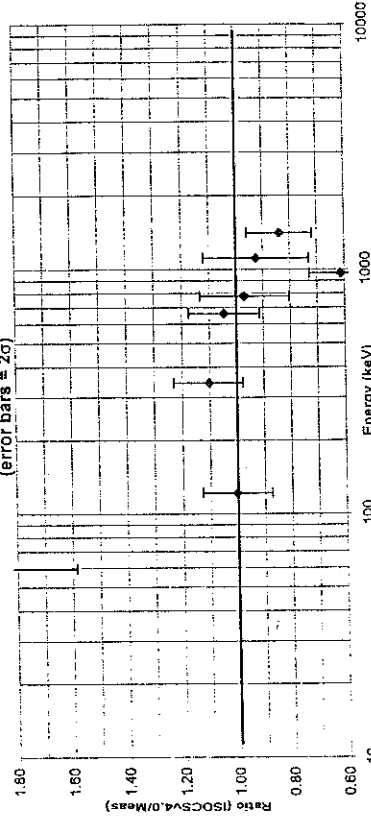
LINE SOURCE AT 45D AND 300CM

(error bars = 1 σ)



LINE SOURCE AT 45D AND 300CM

(error bars = 2 σ)



80 CM LINE SOURCE AT 90 DEGREES, AND 10 CM

Date: October 10, 2000 ISOCS Version: v4.0

The source consist of one Aluminum tube 813mm long by 9.53mm OD and 0.89mm thick walls.
The activity is uniformly distributed in an epoxy matrix.
The rod is positioned vertically upright. The detector is centered along the length of the rod.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (S/N 3578) New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.089	0.775	80.9			Al	2.7	
(2) Src. Top Lay.	80.9					Epoxy	1.07	1
(3) Src. Bot. Lay								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	10	0	0	99999	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: 72.1%C+21.9%O+6%H

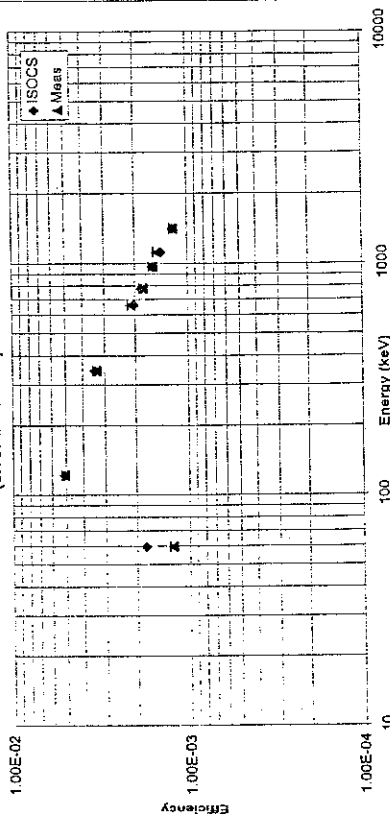
Comparison Results

Energy (keV)	ISOCS efficiency	Measured efficiency 1 σ unc	Measured 2 σ rel. unc	Ratio (ISOCS/Meas)
59.54	1.78E-03	1.25E-03	5.40E-05	8.64E-02
121.78	5.14E-03	5.11E-03	2.19E-04	8.57E-02
344.28	3.42E-03	3.37E-03	1.45E-04	8.61E-02
661.66	2.04E-03	2.12E-03	9.95E-05	9.39E-02
778.9	1.85E-03	1.81E-03	8.39E-05	9.27E-02
964.13	1.58E-03	1.59E-03	7.25E-05	9.12E-02
1112.12	1.42E-03	1.50E-03	6.89E-05	8.19E-02
1408.01	1.22E-03	1.21E-03	5.40E-05	8.93E-02

Dataset	Wt. Mean	Ratio	Std. Dev.	ISOCS Std. Dev.
<150keV	1.14	0.24	0.24	
>150keV	0.99	0.03	0.03	
All	1.02	0.12	0.11	

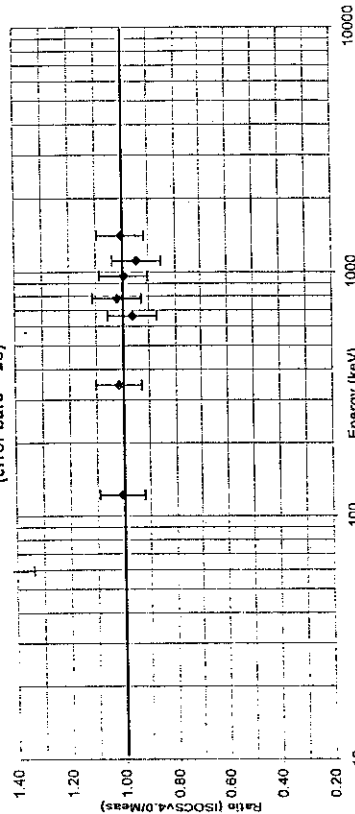
LINE SOURCE AT 90D AND 10CM

(error bars = 1 σ)



LINE SOURCE AT 90D AND 10CM

(error bars = 2 σ)



80 CM LINE SOURCE AT 90 DEGREES, AND 100 CM

Date: October 10, 2000 ISOCS Version: V4.0

The source consist of one Aluminum tube 813mm long by 9.53mm OD and 0.89mm thick walls.
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The rod is positioned vertically upright. The detector is centered along the length of the rod.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER
Detector: 42% (SIN 3578) New characterization
Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.089	0.775	80.9			Al	2.7	
(2) Src. Top Lay.	80.9					Epoxy	1.07	1
(3) Src. Bot. Lay								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	100	0	0	99999	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: 72.1%C+21.9%O+6%H

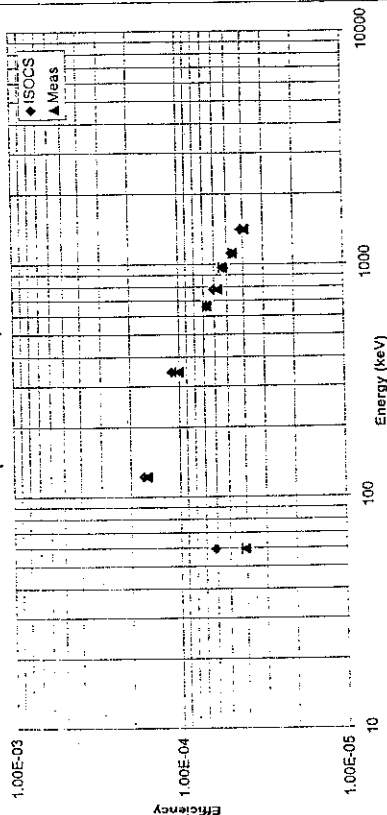
Comparison Results

Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc.	2 σ rel. unc.	Ratio (ISOCS/Meas)
59.54	6.20E-05	4.09E-05	1.90E-06	9.29E-02	1.52
121.78	1.68E-04	1.59E-04	7.01E-06	8.82E-02	1.05
344.28	1.11E-04	1.01E-04	4.43E-06	8.77E-02	1.10
661.66	6.75E-05	6.75E-05	3.23E-06	9.57E-02	1.00
778.9	6.07E-05	5.75E-05	2.92E-06	1.02E-01	1.06
964.13	5.22E-05	5.35E-05	2.55E-06	9.53E-02	0.98
1112.12	4.71E-05	4.63E-05	2.23E-06	9.63E-02	1.02
1408.01	4.12E-05	3.94E-05	1.79E-06	9.09E-02	1.04

Dataset	Wt. Mean Ratio	Wt. Rel. Std. Dev.	ISOCS Std. Dev.
<150keV	1.19	0.26	0.25
>150keV	1.03	0.04	0.04
All	1.06	0.12	0.11

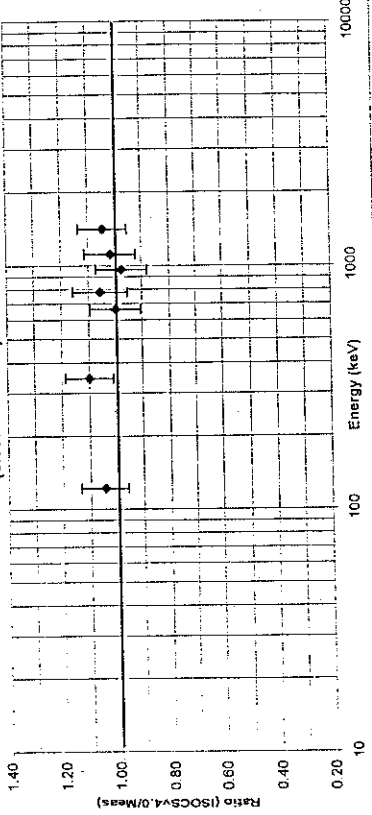
LINE SOURCE AT 90D AND 100CM

(error bars = 1 σ)



LINE SOURCE AT 90D AND 100CM

(error bars = 2 σ)



80 CM LINE SOURCE AT 90 DEGREES, AND 300 CM

Date: October 10, 2000 ISOCS Version: v4.0

The source consist of one Aluminum tube 813mm long by 9.53mm OD and 0.89mm thick walls.

The activity is uniformly distributed in an epoxy matrix.

The rod is positioned vertically upright. The detector is centered along the length of the rod.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (S/N 3578)

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.099	0.775	80.9			Al	2.7	
(2) Src. Top Lay.	80.9					Epoxy	1.07	1
(3) Src. Bot. Lay								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	300	0	0	99999	0			

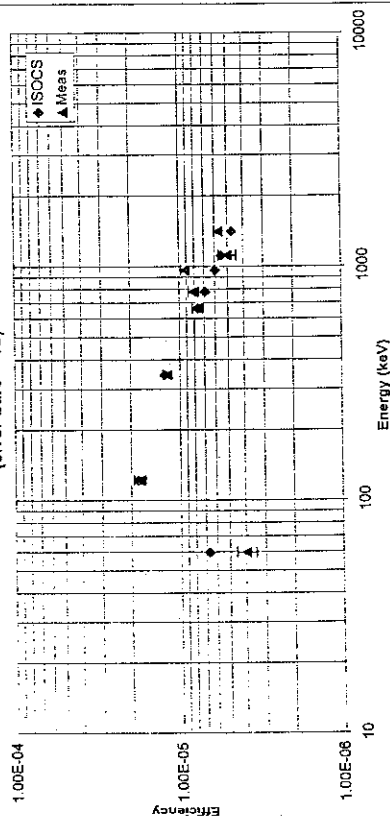
Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

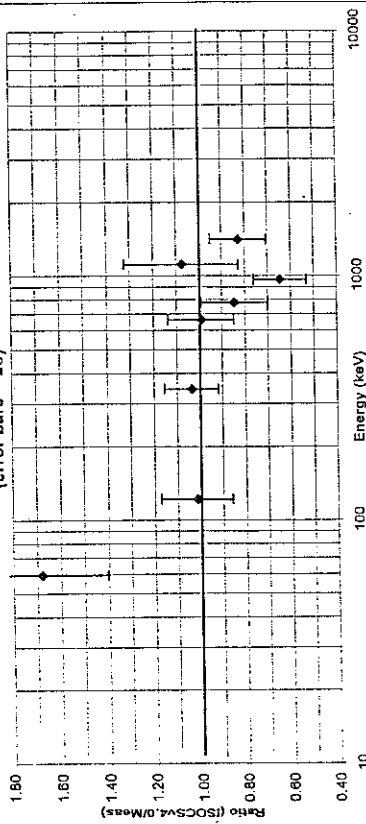
Units: Length: cm Density: g/cc

Source Material: H19_C18_O3

LINE SOURCE AT 90D AND 300CM

(error bars = 1 σ)

LINE SOURCE AT 90D AND 300CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc.	2 σ rel. unc.	Ratio (ISOCS/Meas)
55.54	6.70E-06	3.98E-06	5.51E-07	2.77E-01	1.80
121.78	1.82E-05	1.79E-05	1.40E-06	1.56E-01	1.02
344.28	1.25E-05	1.20E-05	7.08E-07	1.18E-01	1.04
661.66	7.66E-06	7.72E-06	5.54E-07	1.44E-01	0.99
778.9	6.92E-06	8.16E-06	5.97E-07	1.46E-01	0.85
964.13	5.98E-06	9.25E-06	5.27E-07	1.14E-01	0.65
1112.12	5.44E-06	5.05E-06	6.26E-07	2.48E-01	1.08
1408.01	4.72E-06	5.70E-06	3.46E-07	1.21E-01	0.83
Wt. Mean					
Dataset					
Ratio					
Std. Dev.					
Isocs					
<150keV					
1.09					
Std. Dev.					
>150keV					
0.81					
All					
0.84					
0.22					
0.21					

3' x 3' PLANE SOURCE AT 0 DEGREES AND 10CM

Date: October 10, 2000 ISOCS Version: v4.0

The source consists of nine 1' x 1' elements arranged in a 3' x 3' pattern.
Each element consists of a 1' x 1' array of spots covered with Kapton.
The array is offset from the edge 0.5" and the spots are 1" apart.

ISOCS Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (SN 3578), New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Walls	0.00001	91.44	91.44			Air	0.00125	
(2) Layer 1	0.0127					Kapton	1.09	1
(3..11) Lay. 2..10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	10	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

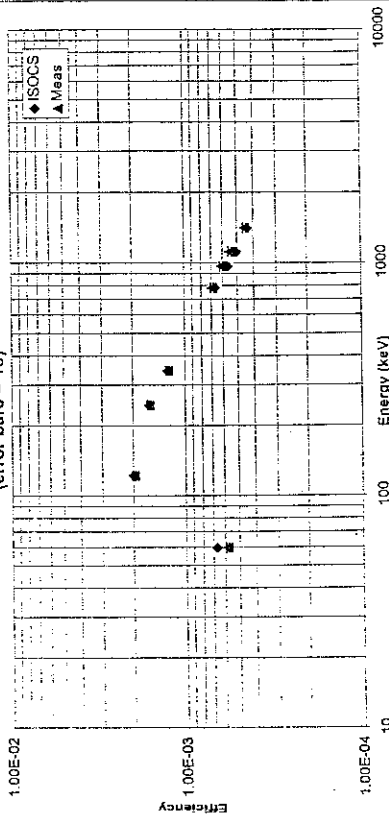
Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: H10_C22_N2_O4

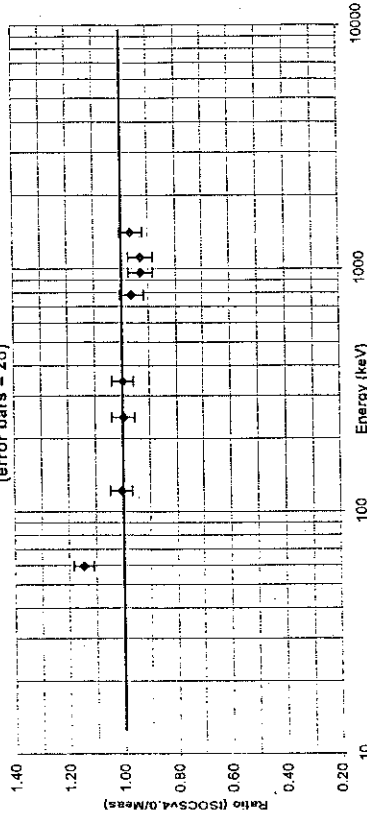
PLANE SOURCE AT 0D AND 10CM

(error bars = 1σ)



PLANE SOURCE AT 0D AND 10CM

(error bars = 2σ)



Comparison Results

Energy (keV)	ISOCS efficiency	Measured			Ratio (ISOCS/Meas)
		efficiency	1 σ unc	2σ rel. unc	
59.54	6.70E-04	5.84E-04	1.06E-05	3.63E-02	1.15
121.78	2.00E-03	1.98E-03	4.13E-05	4.17E-02	1.01
244.7	1.62E-03	1.62E-03	3.56E-05	4.40E-02	1.00
344.28	1.26E-03	1.26E-03	2.63E-05	4.17E-02	1.00
778.9	6.66E-04	6.92E-04	1.57E-05	4.54E-02	0.96
964.13	5.66E-04	6.10E-04	1.37E-05	4.49E-02	0.93
1112.12	5.07E-04	5.46E-04	1.23E-05	4.51E-02	0.93
1408.01	4.35E-04	4.51E-04	9.78E-06	4.34E-02	0.96

Dataset	Wt. Mean		Wt. Rel.	
	Ratio	Std. Dev.	Ratio	Std. Dev.
<150keV	1.08	0.09	0.09	0.09
>150keV	0.96	0.03	0.03	0.02
All	0.99	0.07	0.07	0.07

3' x 3' PLANE SOURCE AT 0 DEGREES AND 100CM

Date: October 10, 2000

ISOCS Version: v4.0

The source consist of nine 1' x 1' elements arranged in a 3' x 3' pattern.
Each element consists of a 1' x 1' array of spots covered with Kapton.
The array is offset from the edge 0.5" and the spots are 1" apart.

ISOCS Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (SN 3578) New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Walls	0.00001	91.44	91.44			Air	0.00125	
(2) Layer 1	0.0127					Kapton	1.09	1
(3..11) Lay. 2..10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

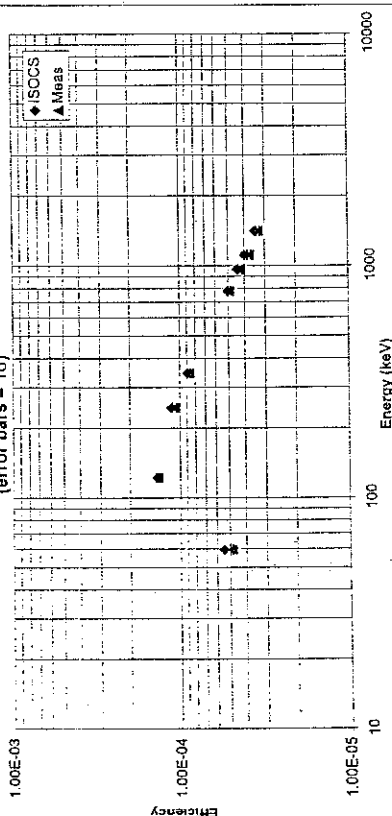
Source Material: H10_C22_N2_O4

Comparison Results

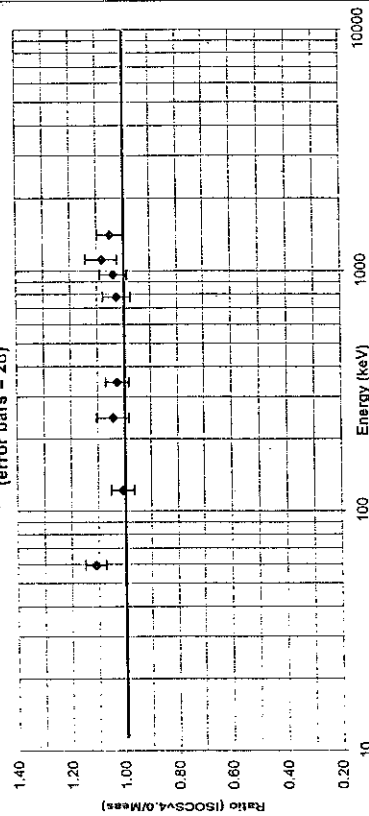
Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc.	2 σ rel. unc.	Ratio (ISOCS/Meas)
59.54	5.46E-05	4.91E-05	9.14E-07	3.72E-02	1.11
121.78	1.37E-04	1.36E-04	2.96E-06	4.35E-02	1.01
244.7	1.13E-04	1.08E-04	3.31E-06	6.13E-02	1.04
344.28	9.00E-05	8.76E-05	1.92E-06	4.38E-02	1.03
778.9	5.08E-05	4.95E-05	1.29E-06	5.21E-02	1.03
964.13	4.42E-05	4.26E-05	1.11E-06	5.21E-02	1.04
1112.12	4.03E-05	3.72E-05	1.08E-06	5.81E-02	1.08
1408.01	3.44E-05	3.28E-05	7.93E-07	4.84E-02	1.05

Dataset	Wt. Mean Ratio	Wt. Rel. Std. Dev.	Isocs Std. Dev.
<150keV	1.06	0.07	0.07
>150keV	1.04	0.02	0.02
All	1.05	0.04	0.03

PLANE SOURCE AT 0D AND 100CM

(error bars = 1 σ)

PLANE SOURCE AT 0D AND 100CM

(error bars = 2 σ)

3' x 3' PLANE SOURCE AT 0 DEGREES AND 300CM

Date: October 10, 2000

ISOCSS Version: v4.0

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Each element consists of a 1' x 1' array of spots covered with kapton.
The array is offset from the edge 0.5" and the spots are 1" apart.

ISOCSS Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (S/N 3578) New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Walls	0.00001	91.44	91.44			Air	0.00125	
(2) Layer 1	0.0127					Kapton	1.09	1
(3..11) Lay. 2..10								
(12) Absorber 1								
(13) Absorber 2								
(14) Sc-Det	300	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

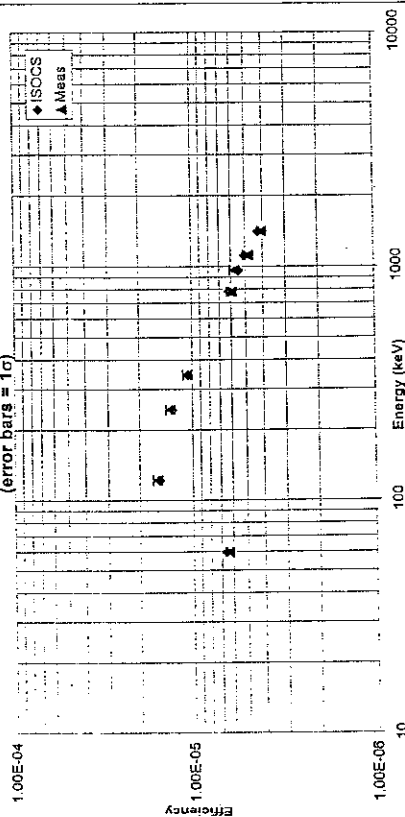
Source Material: H10_C22_N2_O4

Comparison Results

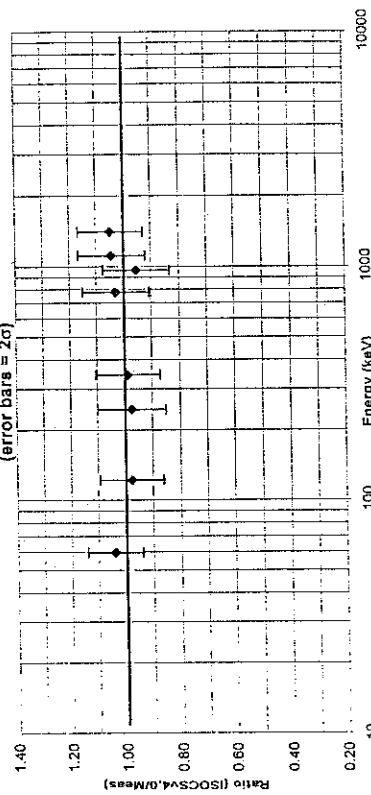
Energy (keV)	ISOCSS efficiency	Measured			Ratio (ISOCSS/Meas)
		efficiency	1 σ unc	2 σ rel. unc	
59.54	6.63E-06	6.37E-06	3.21E-07	1.01E-01	1.04
121.78	1.59E-05	1.59E-05	9.22E-07	1.16E-01	0.98
244.7	1.31E-05	1.34E-05	8.30E-07	1.24E-01	0.98
344.28	1.06E-05	1.07E-05	6.23E-07	1.16E-01	0.99
778.9	6.19E-06	6.01E-06	3.68E-07	1.22E-01	1.03
964.13	5.50E-06	5.76E-06	3.49E-07	1.21E-01	0.95
1112.12	5.07E-06	4.85E-06	2.99E-07	1.23E-01	1.04
1406.01	4.28E-06	4.05E-06	2.40E-07	1.19E-01	1.05

Dataset	Wt. Mean Ratio	Wt. Rel. Std. Dev.	Isocss Std. Dev.
<150keV	1.01	0.04	0.04
>150keV	1.00	0.04	0.04
All	1.01	0.04	0.04

PLANE SOURCE AT 0D AND 300CM

(error bars = 1 σ)

PLANE SOURCE AT 0D AND 300CM

(error bars = 2 σ)

3' x 3' PLANE SOURCE AT 45 DEGREES AND 10CM

Date: October 10, 2000 ISOCS Version: v4.0

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The array is offset from the edge 0.5" and the spots are 1" apart.

ISOCS Geometry Parameters

Template: RECTANGULAR PLANE
Detector: 42% (SIN 3578) New characterization
Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Walls	0.00001	91.44	91.44			Air	0.00125	1
(2) Layer 1	0.0127					Kapton	1.09	
(3..11) Lay. 2..10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	10	0	0	10	0			

Air: Temp: 20 C. Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: H10_C22_N2_O4

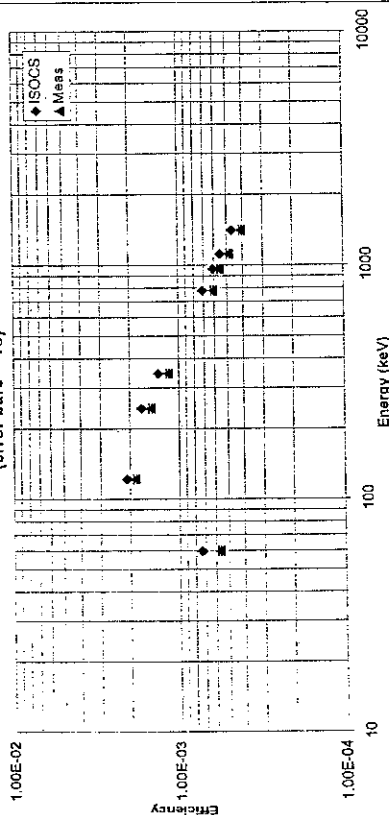
Comparison Results

Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)
59.54	7.38E-04	5.73E-04	1.04E-05	3.63E-02	1.29
121.78	2.09E-03	1.87E-03	3.89E-05	4.16E-02	1.12
244.7	1.69E-03	1.50E-03	3.33E-05	4.44E-02	1.13
344.28	1.33E-03	1.17E-03	2.45E-05	4.19E-02	1.14
778.9	7.16E-04	6.20E-04	1.39E-05	4.48E-02	1.15
964.13	6.14E-04	5.60E-04	1.26E-05	4.50E-02	1.10
1112.12	5.52E-04	4.91E-04	1.10E-05	4.48E-02	1.12
1408.01	4.68E-04	4.11E-04	8.95E-06	4.36E-02	1.14

Dataset	Wt. Mean Ratio	Wt. Rel. Std. Dev.	ISOCS Std. Dev.
<150keV	1.20	0.10	0.10
>150keV	1.13	0.02	0.02
All	1.15	0.05	0.05

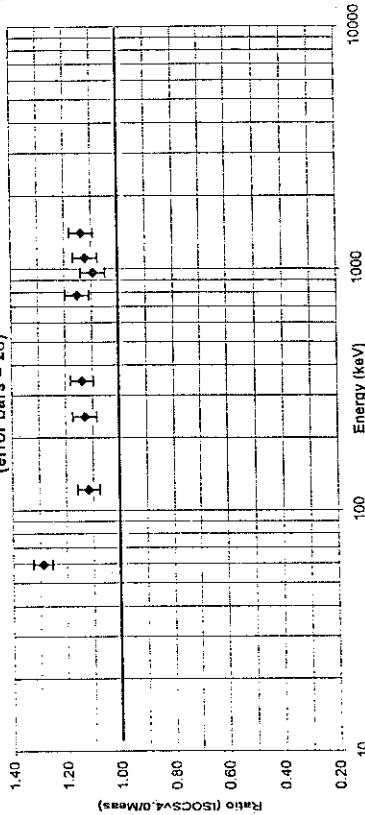
PLANE SOURCE AT 45D AND 10CM

(error bars = 1 σ)



PLANE SOURCE AT 45D AND 10CM

(error bars = 2 σ)



3' x 3' PLANE SOURCE AT 45 DEGREES AND 100CM Date: October 10, 2000 ISOS Version: v4.0

The source consist of nine 1' x 1' elements arranged in a 3' x 3' pattern.
Each element consists of a 1' x 1' array of spots covered with kapton.
The array is offset from the edge 0.5" and the spots are 1" apart.

ISOS Geometry Parameters

Template: RECTANGULAR PLANE
Detector: 42% (S/N 3578) New characterization
Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Walls	0.00001	91.44	91.44			Air	0.00125	
(2) Layer 1	0.0127					Kapton	1.09	1
(3..11) Lay. 2..10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	100	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

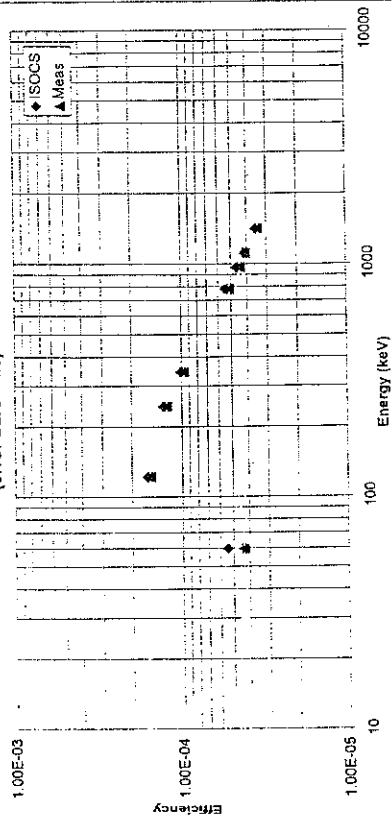
Source Material: H10_C22_N2_O4

Comparison Results

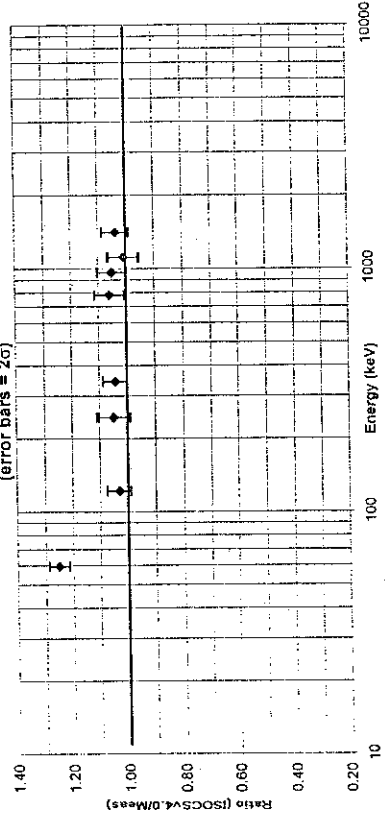
Energy (keV)	ISOS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOS/Meas)
59.54	5.45E-05	4.35E-05	8.13E-07	3.74E-02	1.25
121.78	1.81E-04	1.56E-04	3.37E-06	4.32E-02	1.03
244.7	1.29E-04	1.23E-04	3.27E-06	5.32E-02	1.05
344.28	1.02E-04	9.74E-05	2.11E-06	4.33E-02	1.04
778.9	5.46E-05	5.14E-05	1.35E-06	5.25E-02	1.06
964.13	4.64E-05	4.41E-05	1.14E-06	5.17E-02	1.05
1112.12	4.16E-05	4.11E-05	1.08E-06	5.26E-02	1.01
1408.01	3.54E-05	3.41E-05	8.21E-07	4.82E-02	1.04

Dataset	Ratio	Wt. Mean	Std. Dev.	Isocs
<150keV	1.14	1.14	0.14	0.13
>150keV	1.04	1.04	0.02	0.02
All	1.07	1.07	0.08	0.07

PLANE SOURCE AT 45D AND 100CM (error bars = 2 σ)



PLANE SOURCE AT 45D AND 100CM (error bars = 2 σ)



3' x 3' PLANE SOURCE AT 45 DEGREES AND 300CM

Date: October 10, 2000

ISOCs Version: v4.0

The source consist of nine 1' x 1' elements arranged in a 3' x 3' pattern.
Each element consists of a 1' x 1' array of spots covered with kapton.
The array is offset from the edges 0.5" and the spots are 1" apart.

ISOCs Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (S/N 3578) New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Walls	0.0001	91.44	91.44			Air	0.00125	
(2) Layer 1	0.0127					Kapton	1.09	1
(3..11) Lay. 2..10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	300	0	0	300	0			

Air: Temp: 20 C. Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: H10_C22_N2_O4

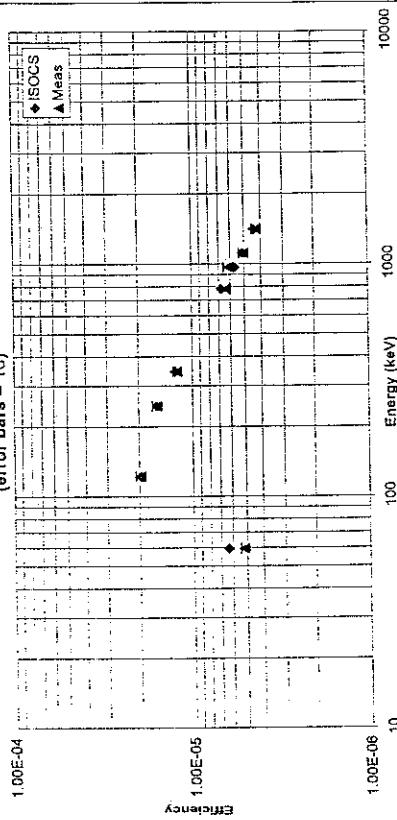
Comparison Results

Energy (keV)	ISOCs efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCs/Meas)
59.54	6.38E-06	5.18E-06	2.62E-07	1.01E-01	1.23
121.78	1.96E-05	1.98E-05	1.16E-06	1.17E-01	0.99
244.7	1.59E-05	1.59E-05	9.70E-07	1.22E-01	1.00
344.28	1.25E-05	1.22E-05	7.06E-07	1.16E-01	1.03
778.9	6.77E-06	6.41E-06	3.93E-07	1.23E-01	1.06
964.13	5.72E-06	6.19E-06	3.74E-07	1.21E-01	0.92
1112.12	5.11E-06	5.05E-06	3.11E-07	1.23E-01	1.01
1408.01	4.42E-06	4.26E-06	2.52E-07	1.18E-01	1.04

Dataset	Wt. Mean Ratio	Wt. Rel. Std. Dev.	Isocs Std. Dev.
<150keV	1.10	0.15	0.14
>150keV	1.01	0.05	0.05
All	1.03	0.09	0.06

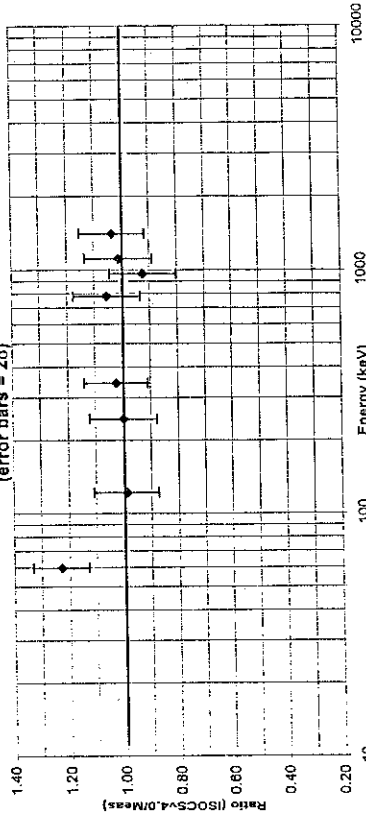
PLANE SOURCE AT 45D AND 300CM

(error bars = 1 σ)



PLANE SOURCE AT 45D AND 300CM

(error bars = 2 σ)



3' x 3' PLANE SOURCE AT 90 DEGREES AND 10CM

Date: October 10, 2000 ISOS Version: v4.0

The source consist of nine 1' x 1' elements arranged in a 3' x 3' pattern.
Each element consists of a 1' x 1' array of spots covered with kapton.
The array is offset from the edge 0.5" and the spots are 1" apart.

ISOS Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (SIN 3578) New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Walls	0.00001	91.44	91.44			Air	0.00125	1
(2) Layer 1	0.0127					Kapton	1.09	
(3, 11) Lay. 2..10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	10	0	0	9999	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

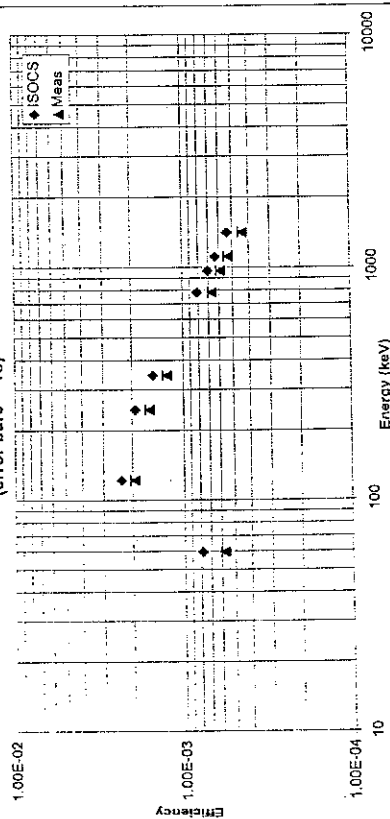
Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: H10_C22_N2_O4

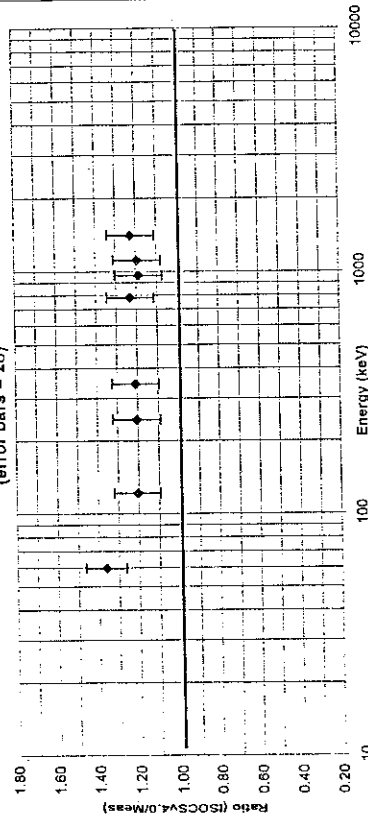
PLANE SOURCE AT 90D AND 10CM

(error bars = 1σ)



PLANE SOURCE AT 90D AND 10CM

(error bars = 2σ)



Comparison Results

Energy (keV)	ISOS efficiency	Measured			Ratio (ISOS/Meas)
		efficiency	1 σ unc.	2 σ rel. unc.	
59.54	7.86E-04	5.76E-04	2.89E-05	1.00E-01	1.36
121.78	2.35E-03	1.95E-03	1.11E-04	1.14E-01	1.21
244.7	1.92E-03	1.59E-03	9.18E-05	1.15E-01	1.21
344.28	1.51E-03	1.25E-03	7.12E-05	1.14E-01	1.21
778.9	8.20E-04	6.66E-04	3.83E-05	1.15E-01	1.23
964.13	7.04E-04	5.91E-04	3.42E-05	1.18E-01	1.19
1112.12	5.33E-04	5.29E-04	3.06E-05	1.16E-01	1.20
1408.01	5.38E-04	4.38E-04	2.51E-05	1.15E-01	1.23
Wt. Mean					
		Ratio	Std. Dev.	Wt. Rel.	Isocs
		1.29	0.09	0.09	0.07
		<150keV	1.21	0.01	0.01
		>150keV	1.23	0.05	0.05
		All			

3' x 3' PLANE SOURCE AT 90 DEGREES AND 100CM

Date: October 10, 2000

ISOCS Version: v4.0

The source consists of nine 1' x 1' elements arranged in a 3' x 3' pattern.
Each element consists of a 1' x 1' array of spots covered with kapton.
The array is offset from the edge 0.5" and the spots are 1" apart.

ISOCS Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (S/N 3578) New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Walls	0.00001	91.44	91.44			Air	0.00125	1
(2) Layer 1	0.0127					Kapton	1.09	
(3..11) Lay. 2..10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	99999	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

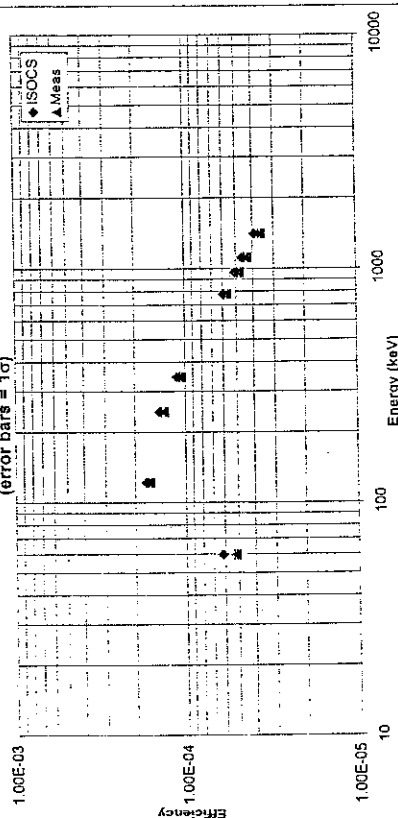
Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: H10_C22_N2_O4

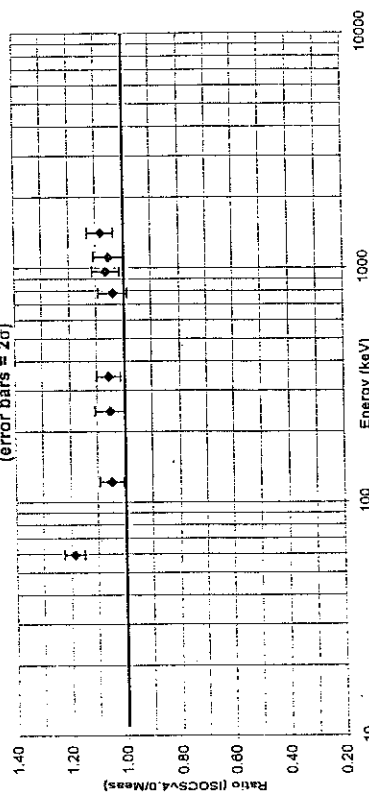
PLANE SOURCE AT 90D AND 100CM

(error bars = 1σ)



PLANE SOURCE AT 90D AND 100CM

(error bars = 2σ)



Comparison Results

Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc	2σ rel. unc	Ratio (ISOCS/Meas)
59.54	6.22E-05	5.24E-05	9.73E-07	3.71E-02	1.19
121.78	1.72E-04	1.84E-04	3.55E-06	4.33E-02	1.05
244.7	1.42E-04	1.35E-04	3.65E-06	5.41E-02	1.05
344.28	1.12E-04	1.06E-04	2.31E-06	4.36E-02	1.06
778.9	5.98E-05	5.75E-05	1.51E-06	5.25E-02	1.04
964.13	5.12E-05	4.81E-05	1.20E-06	4.99E-02	1.07
1112.12	4.61E-05	4.37E-05	1.15E-06	5.26E-02	1.05
1408.01	3.91E-05	3.61E-05	8.61E-07	4.77E-02	1.08

Dataset	Wt. Mean Ratio	Wt. Rel. Std. Dev.	ISOCS Std. Dev.
<150keV	1.12	0.09	0.08
>150keV	1.06	0.01	0.01
All	1.08	0.05	0.04

3' x 3' PLANE SOURCE AT 90 DEGREES AND 300CM

Date: October 10, 2000 ISOCS Version: v4.0

The source consist of nine 1' x 1' elements arranged in a 3' x 3' pattern. Each element consists of a 1' x 1' array of spots covered with kapton. The array is offset from the edge 0.5" and the spots are 1" apart.

ISOCS Geometry Parameters

Template: RECTANGULAR PLANE
Detector: 42% (SN 3578) New characterization
Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Walls	0.00001	91.44	91.44			Air	0.00125	
(2) Layer 1	0.0127					Kapton	1.09	1
(3..11) Lay. 2..10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	300	0	0	99999	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: H10_C22_N2_O4

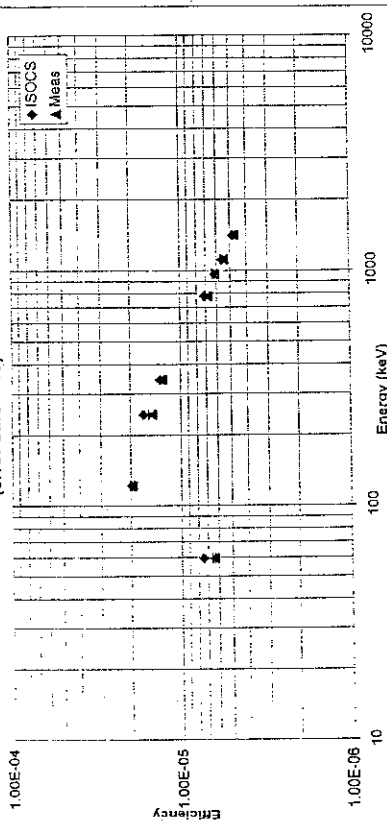
Comparison Results

Energy (keV)	ISOCS efficiency	Measured			Ratio (ISOCS/Meas)
		efficiency	1 σ unc	2 σ rel. unc	
59.54	7.46E-06	6.47E-06	1.28E-07	3.96E-02	1.15
121.78	1.98E-05	1.97E-05	5.59E-07	5.68E-02	1.00
244.7	1.67E-05	1.49E-05	6.18E-07	8.30E-02	1.12
344.28	1.33E-05	1.29E-05	3.29E-07	5.10E-02	1.03
778.9	7.18E-06	6.85E-06	2.50E-07	7.30E-02	1.05
964.13	6.18E-06	6.20E-06	2.22E-07	7.16E-02	1.00
1112.12	6.88E-06	5.47E-06	2.10E-07	7.68E-02	1.02
1408.01	4.80E-06	4.72E-06	1.40E-07	5.93E-02	1.02

Dataset	Wt. Mean Ratio	Wt. Rel. Std. Dev.	ISOCS Std. Dev.
<150keV	1.09	0.09	0.09
>150keV	1.03	0.03	0.01
All	1.06	0.06	0.05

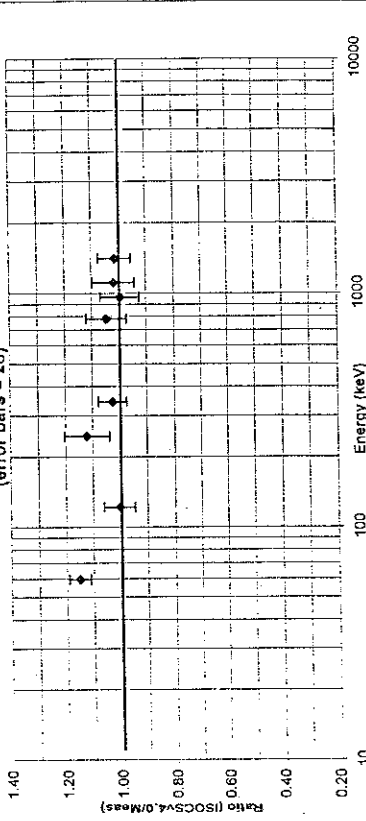
PLANE SOURCE AT 90D AND 300CM

(error bars = 1 σ)



PLANE SOURCE AT 90D AND 300CM

(error bars = 2 σ)



Appendix D: Data Sheets for Laboratory Counting Geometry Validation Test

The data sheets for the Laboratory counting geometry tests are included in this section. The format of the data sheet is similar to those in the Field geometry. For the validation tests where cascade summing is a problem, the data sheets contain the correction factors that have been applied to the original data.

20ML VIAL, AT 0CM AND PERPENDICULAR TO DET AXIS

ISOCS Version: v4.0

Date: August 10, 2000

The source consist of one 20 mL Packard vial. 62mm long by 27.0mm OD and 1.0mm thick walls.
The activity is uniformly distributed in an epoxy matrix filling the vial 42mm from the inside bottom.
The vial is positioned perpendicular to the detector axis, and centered about its active length.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (SIN 3578), New DCG

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.1	2.5	6.2			PolyProp	0.9	
(2) Src. Top Lay.								
(3) Src. Bot Lay.	4.2					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0.00001	0	-1	0	-1			

Air: Temp: 20 C Rel Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: .1 %

Units: Length: cm Density: g/cc

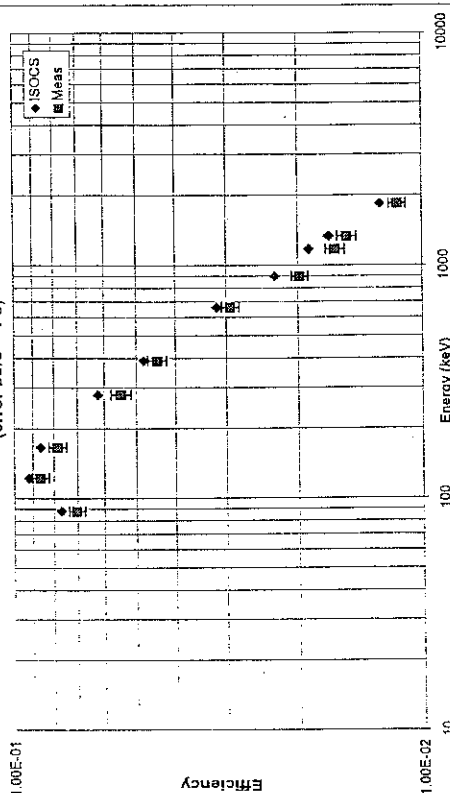
Source Material: 21.9%O+6%⁶⁴H+72.1%⁶⁰Co

Comparison Results

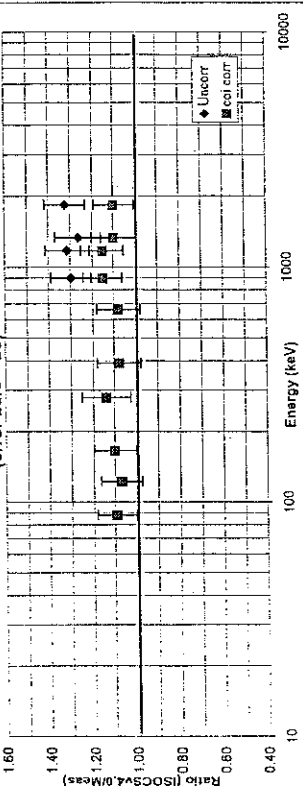
Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff + COI	Measured efficiency	1 σ unc	2 σ rel unc	Ratio (ISOCS/Meas)	Corr. Ratio
88.03	7.70E-02	1	7.70E-02	7.04E-02	3.22E-03	0.09	1.09	1.09
122.06	9.23E-02	1	9.23E-02	8.63E-02	4.15E-03	0.10	1.07	1.07
165.85	8.63E-02	1	8.63E-02	7.84E-02	3.91E-03	0.10	1.10	1.10
279.19	6.23E-02	1	6.23E-02	5.47E-02	3.08E-03	0.11	1.14	1.14
391.69	4.79E-02	1	4.79E-02	4.44E-02	2.28E-03	0.10	1.08	1.08
661.65	3.17E-02	1	3.17E-02	2.93E-02	1.48E-03	0.10	1.08	1.08
898.02	2.57E-02	0.89	2.28E-02	1.98E-02	9.05E-04	0.09	1.30	1.15
1173.22	2.14E-02	0.88	1.88E-02	1.63E-02	8.06E-04	0.10	1.31	1.15
1332.49	1.93E-02	0.87	1.68E-02	1.53E-02	8.01E-04	0.10	1.26	1.10
1836.01	1.52E-02	0.83	1.26E-02	1.15E-02	5.33E-04	0.09	1.33	1.10
				Wt. Mean	Ratio	Std. Dev.	ISOCS	
				Dataset	<150keV	1.08	0.02	0.02
				>150keV	1.11	0.03	0.03	0.03
				All	1.11	0.03	0.03	0.03

The ISOCS efficiencies for Co-60 and Y-88 have been reduced to take into account the coincidence summing losses.

LAB SOURCE PERPENDICULAR AT 0CM

(error bars = 1 σ)

LAB SOURCE PERPENDICULAR AT 0CM

(error bars = 2 σ)

20ML VIAL, AT 5CM AND PERPENDICULAR TO DET AXIS

Date: August 10, 2000

ISOCs Version: v4.0

The source consist of one 20 mL Packard vial, 62mm long by 27.0mm OD and 1.0mm thick walls.
 The activity is uniformly distributed in an epoxy matrix filling the vial 42mm from the inside bottom.
 The vial is positioned perpendicular to the detector axis, and centered about its active length.

ISOCs Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (S/N 3578), New DCG

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.1	2.5	6.2			PolyProp	0.9	
(2) Src. Top Lay.								
(3) Src. Bot Lay.	4.2					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	5	0	-1	0	-1			

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: .1 %

Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%H+72.1%C

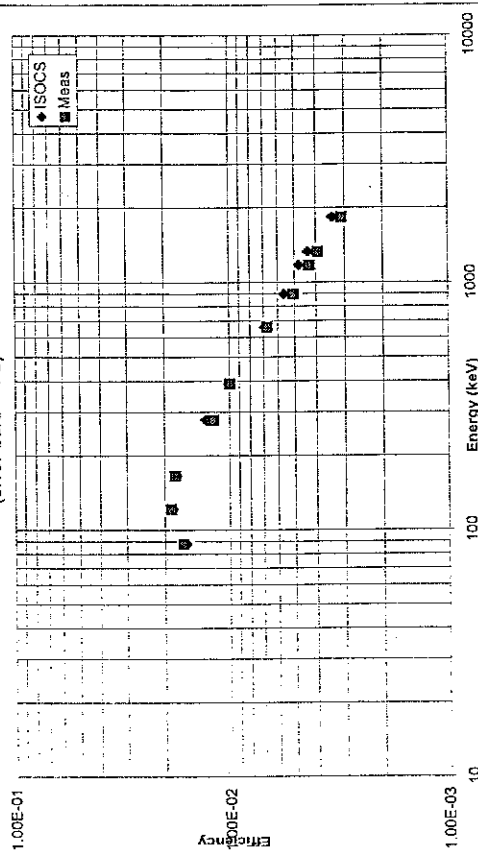
Comparison Results

Energy (keV)	ISOCs efficiency	COI factor	ISOCs eff	* COI	efficiency	Measured	1 σ unc	2 σ rel unc	Ratio (ISOCs/Meas)	Ratio	Corr. Ratio
88.03	1.59E-02	1	1.59E-02		1.64E-02	7.58E-04	0.09	0.09	0.97		0.97
122.06	1.84E-02	1	1.84E-02		1.87E-02	9.10E-04	0.10	0.10	0.99		0.99
165.85	1.76E-02	1	1.76E-02		1.79E-02	8.99E-04	0.10	0.09	0.98		0.98
279.19	1.29E-02	1	1.29E-02		1.21E-02	7.66E-04	0.13	0.13	1.07		1.07
391.69	1.02E-02	1	1.02E-02		1.00E-02	5.07E-04	0.10	0.10	1.02		1.02
661.65	6.92E-03	1	6.92E-03		6.74E-03	3.51E-04	0.10	0.10	1.03		1.03
898.02	5.77E-03	0.97	5.62E-03		5.05E-03	2.28E-04	0.09	0.09	1.14		1.11
1173.22	4.92E-03	0.97	4.79E-03		4.28E-03	2.07E-04	0.10	0.10	1.15		1.12
1332.49	4.48E-03	0.97	4.35E-03		3.92E-03	1.94E-04	0.10	0.10	1.14		1.11
1836.01	3.53E-03	0.86	3.40E-03		3.09E-03	1.39E-04	0.09	0.09	1.14		1.10
										Wt. Mean	ISOCs
										Ratio	Std. Dev.
										Dataset	Std. Dev.
										<150keV	0.01
										>150keV	0.003
										All	0.03

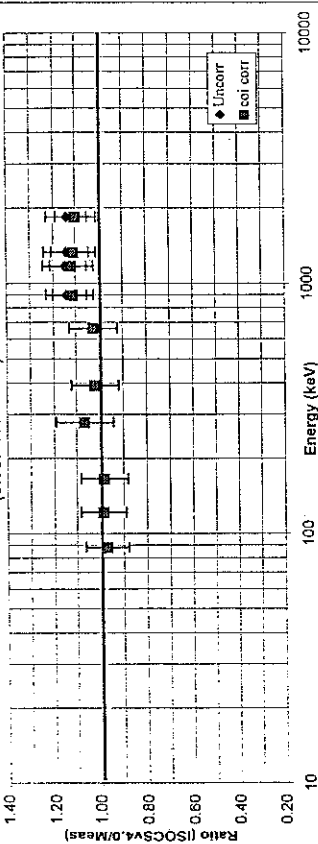
The ISOCs efficiencies for Co-60 and Y-88

have been reduced to take into account the
 coincidence summing losses.

LAB SOURCE PERPENDICULAR AT 5CM

(error bars = 1 σ)

LAB SOURCE PERPENDICULAR AT 5CM

(error bars = 2 σ)

20ML VIAL, AT 10CM AND PERPENDICULAR TO DET AXIS.

Date: August 10, 2000

ISOCs Version: v4.0

The source consist of one 20 mL Packard vial. 62mm long by 27.0mm OD and 1.0mm thick walls.
 The activity is uniformly distributed in an epoxy matrix filling the vial 42mm from the inside bottom.
 The vial is positioned perpendicular to the detector axis, and centered about its active length.

ISOCs Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (SIN 3578), New DCG

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.1	2.5	6.2			PolyProp	0.9	
(2) Src. Top Lay.								
(3) Src. Bot Lay.	4.2					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	10	0	-1	0	-1			

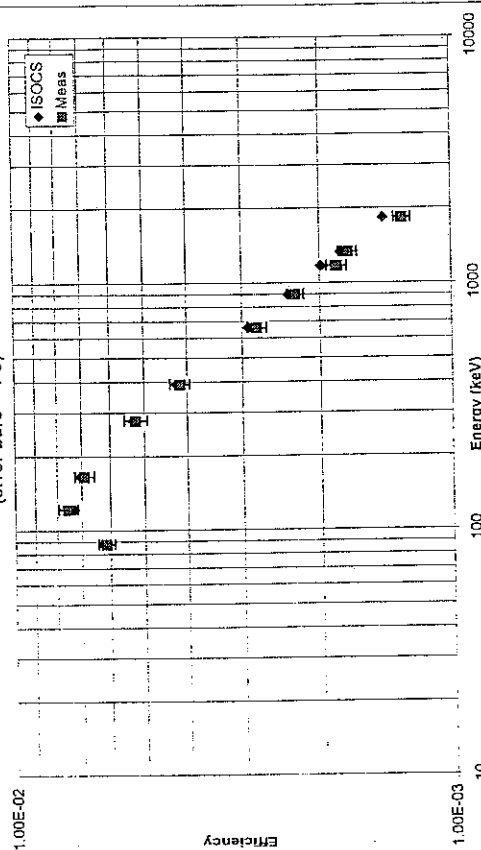
Air. Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: .1 %

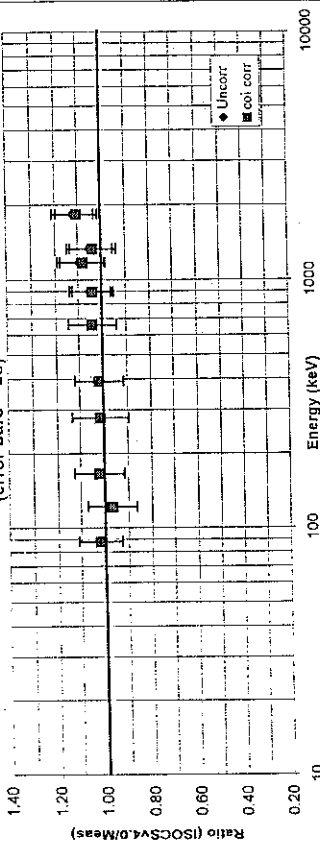
Units: Length: cm Density: g/cc

Source Material: 21.9%O+8%H+72.1%C

LAB SOURCE PERPENDICULAR AT 10CM

(error bars = 1 σ)

LAB SOURCE PERPENDICULAR AT 10CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCs efficiency	COI factor	ISOCs eff * COI	efficiency	Measured 1 σ unc	2 σ rel unc	Ratio (ISOCs/Meas)	Ratio	Corr. Ratio
88.03	6.26E-03	1	6.26E-03	6.14E-03	2.82E-04	0.09	1.02	1.02	1.02
122.06	7.30E-03	1	7.30E-03	7.55E-03	3.93E-04	0.10	0.97	0.97	0.97
165.85	7.06E-03	1	7.06E-03	6.91E-03	3.63E-04	0.11	1.02	1.02	1.02
279.15	5.32E-03	1	5.32E-03	5.24E-03	3.14E-04	0.12	1.01	1.01	1.01
391.69	4.22E-03	1	4.22E-03	4.15E-03	2.15E-04	0.10	1.02	1.02	1.02
661.65	2.91E-03	1	2.91E-03	2.79E-03	1.41E-04	0.10	1.04	1.04	1.04
898.02	2.40E-03	0.99	2.37E-03	2.28E-03	9.98E-05	0.09	1.05	1.05	1.04
1173.22	2.01E-03	0.99	1.99E-03	1.84E-03	8.86E-05	0.10	1.09	1.09	1.08
1332.49	1.83E-03	0.99	1.81E-03	1.74E-03	8.55E-05	0.10	1.05	1.05	1.04
1836.01	1.46E-03	0.98	1.44E-03	1.30E-03	5.84E-05	0.09	1.12	1.12	1.10
Wt. Mean									Isocs
Dataset									Wt. Rel.
<150keV									Std. Dev.
>150keV									Std. Dev.
All									Std. Dev.
Ratio									Ratio
0.99									0.04
1.05									0.03
1.04									0.04

The ISOCs efficiencies for Co-60 and Y-88

have been reduced to take into account the

coincidence summing losses.

20ML VIAL, AT 20CM AND PERPENDICULAR TO DET AXIS.

Date: August 10, 2000 ISOCS Version: v4.0

The source consist of one 20 mL Packard vial. 62mm long by 27.0mm OD and 1.0mm thick walls.
 The activity is uniformly distributed in an epoxy matrix filling the vial 42mm from the inside bottom.
 The vial is positioned perpendicular to the detector axis, and centered about its active length.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (S/N 3578), New DCG

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.1	2.5	6.2			PolyProp	0.9	
(2) Src. Top Lay.								
(3) Src. Bot Lay.	4.2					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	20	0	-1	0	-1			

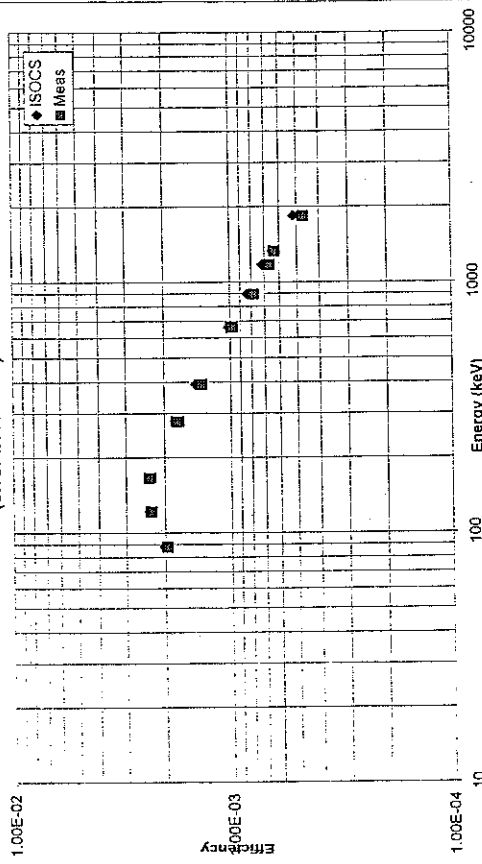
Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: .1 %

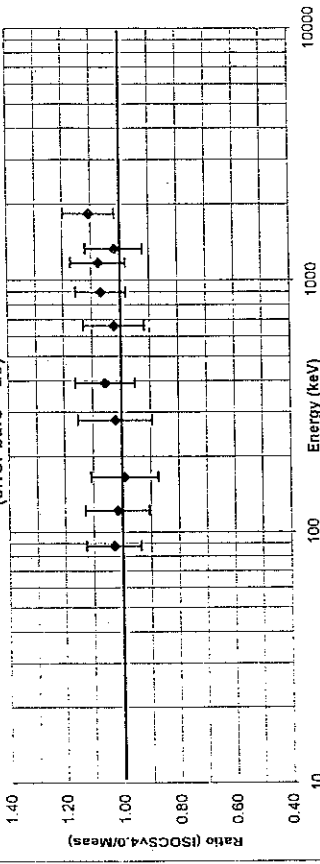
Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%H+72.1%C

LAB SOURCE PERPENDICULAR AT 20CM

(error bars = 1 σ)

LAB SOURCE PERPENDICULAR AT 20CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc	2 σ rel. uncert.	Ratio (ISOCS/Measured)
88.03	2.02E-03	1.96E-03	9.25E-05	0.09	1.03
122.06	2.36E-03	2.32E-03	1.28E-04	0.11	1.02
165.85	2.33E-03	2.35E-03	1.38E-04	0.12	0.99
279.19	1.79E-03	1.75E-03	1.13E-04	0.13	1.02
391.69	1.44E-03	1.36E-03	7.06E-05	0.10	1.06
661.55	1.01E-03	9.88E-04	5.16E-05	0.10	1.02
898.02	8.40E-04	7.86E-04	3.47E-05	0.09	1.07
1173.22	7.16E-04	6.65E-04	3.19E-05	0.10	1.08
1332.49	6.43E-04	6.30E-04	3.08E-05	0.10	1.02
1836.01	5.19E-04	4.68E-04	2.07E-05	0.09	1.11
Wt. Mean					
Dataset					
<150keV					
>150keV					
All					
	Ratio	Wt. Mean	Std. Dev.	Std. Dev.	Isocs
	1.03	1.03	0.01	0.01	
	1.05	1.05	0.04	0.04	
	1.05	1.05	0.03	0.03	

20ML VIAL END-ON, AT 0CM FROM THE DETECTOR

Date: August 10, 2000

ISOCSS Version: v4.0

The source consist of one 20 mL Packard vial. 62mm long by 27.0mm OD and 1.0mm thick walls.
The activity is uniformly distributed in an epoxy matrix filling the vial 42mm from the inside bottom.
The vial is positioned end-on to the detector, and centered on the endcap front face.

ISOCSS Geometry Parameters

Template: BEAKER

Detector: 42% (S/N 3578), New DCG

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker								
(2) Top layer	4.2	Container dimensions from the file 20cc.BKR				Epoxy	1.15	1
(3) Bottom layer								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0	0	0	0	0			

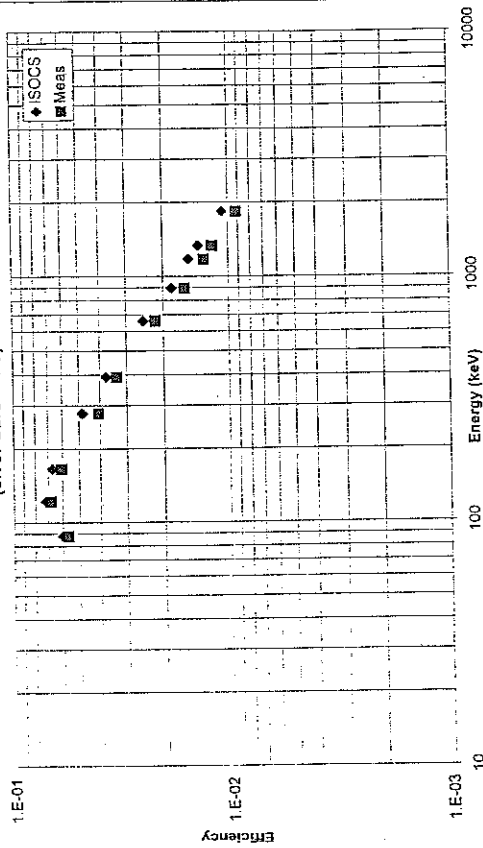
Air: Temp: 20 C. Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: .1 %

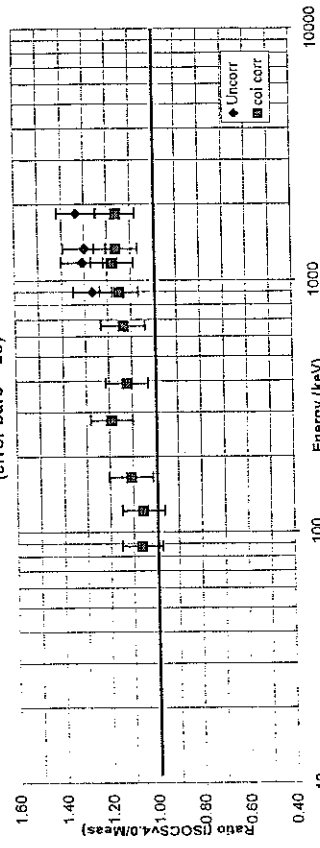
Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%⁶⁰H+72.1%⁶⁰C

LAB SOURCE PARALLEL AT 0CM

(error bars = 1 σ)

LAB SOURCE PARALLEL AT 0CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCSS efficiency	COI factor	ISOCSS eff * COI	efficiency	Measured 1 σ unc	2 σ rel. unc	Ratio (ISOCSS/Meas)	Corr. Ratio
88.03	6.02E-02	1	6.02E-02	5.67E-02	2.54E-03	0.09	1.06	1.06
122.06	7.17E-02	1	7.17E-02	6.79E-02	3.15E-03	0.09	1.06	1.06
165.85	6.70E-02	1	6.70E-02	6.05E-02	2.87E-03	0.09	1.11	1.11
279.19	4.83E-02	1	4.83E-02	4.06E-02	1.86E-03	0.09	1.19	1.19
391.69	3.73E-02	1	3.73E-02	3.33E-02	1.56E-03	0.09	1.12	1.12
661.65	2.48E-02	1	2.48E-02	2.19E-02	1.06E-03	0.10	1.13	1.13
898.02	2.03E-02	0.91	1.84E-02	1.60E-02	6.69E-04	0.08	1.27	1.15
1173.22	1.70E-02	0.90	1.53E-02	1.30E-02	6.03E-04	0.09	1.31	1.18
1332.49	1.55E-02	0.89	1.38E-02	1.19E-02	5.67E-04	0.10	1.30	1.18
1836.01	1.23E-02	0.87	1.07E-02	9.20E-03	3.89E-04	0.08	1.34	1.16
				WT Mean	Ratio	Std. Dev.	ISOCSS	
				Dataset	Ratio	Std. Dev.	ISOCSS	
				<150keV	1.06	0.005	0.005	
				>150keV	1.15	0.024	0.024	
				All	1.13	0.04	0.04	

The ISOCSS efficiencies for Co-60 and Y-88 have been reduced to take into account the coincidence summing losses.

20ML VIAL END-ON, AT 5CM FROM THE DETECTOR

Date: August 10, 2000

ISOCS Version: v4.0

The source consist of one 20 mL Packard vial. 62mm long by 27.0mm OD and 1.0mm thick walls.
 The activity is uniformly distributed in an epoxy matrix filling the vial 42mm from the inside bottom.
 The vial is positioned end-on to the detector, and centered on the endcap front face.

ISOCS Geometry Parameters

Template: BEAKER

Detector: 42% (SN 3578), New DCG

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker								
(2) Top layer	4.2	Container dimensions from the file 20cc.BKR				Epoxy	1.15	1
(3) Bottom layer								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	5	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: .1 %

Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%⁶⁴H+72.1%⁶⁰Co

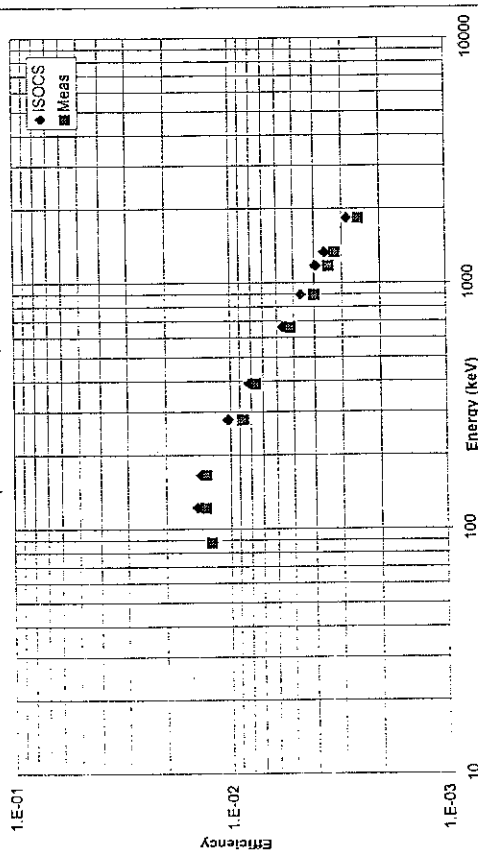
Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff * COI	efficiency	Measured 1σ unc	2σ rel. unc	Ratio (ISOCS/Meas)	Ratio	Corr. Ratio
88.03	1.23E-02	1	1.23E-02	1.24E-02	5.64E-04	0.09	0.99	0.99	0.99
122.06	1.44E-02	1	1.44E-02	1.32E-02	6.43E-04	0.10	1.09	1.09	1.09
165.85	1.38E-02	1	1.38E-02	1.31E-02	6.43E-04	0.10	1.05	1.05	1.05
279.19	1.03E-02	1	1.03E-02	8.75E-03	4.63E-04	0.11	1.17	1.17	1.17
391.69	8.18E-03	1	8.18E-03	7.62E-03	3.68E-04	0.10	1.07	1.07	1.07
661.65	5.63E-03	1	5.63E-03	5.20E-03	2.57E-04	0.10	1.08	1.08	1.08
898.02	4.73E-03	0.98	4.62E-03	4.02E-03	1.72E-04	0.09	1.18	1.18	1.15
1173.22	4.05E-03	0.98	3.96E-03	3.47E-03	1.64E-04	0.09	1.17	1.17	1.14
1332.49	3.70E-03	0.98	3.61E-03	3.25E-03	1.57E-04	0.10	1.14	1.14	1.11
1836.01	2.94E-03	0.97	2.85E-03	2.50E-03	1.08E-04	0.09	1.18	1.18	1.14
				Wt Mean			Wt. Rel.	Isocs	
				Dataset	Ratio		Std. Dev.	Std. Dev.	
				<150keV	1.03		0.06	0.06	0.04
				>150keV	1.11		0.04	0.04	0.04
				All	1.10		0.05	0.05	0.02

The ISOCS efficiencies for Co-60 and Y-88 have been reduced to take into account the coincidence summing losses.

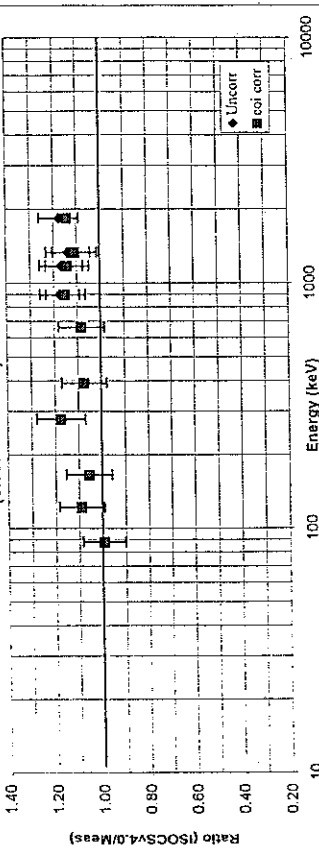
LAB SOURCE VERTICAL AT 5CM

(error bars = 1 σ)



LAB SOURCE PARALLEL AT 5CM

(error bars = 2σ)



20ML VIAL END-ON, AT 10CM FROM THE DETECTOR

Date: August 10, 2000

ISOCs Version: v4.0

The source consist of one 20 mL Packard vial, 62mm long by 27.0mm OD and 1.0mm thick walls.
 The activity is uniformly distributed in an epoxy matrix filling the vial 42mm from the inside bottom.
 The vial is positioned vertically upright. The vial is centered on the endcap front face.

ISOCs Geometry Parameters

Template: BEAKER

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker								
(2) Top layer	4.2					Epoxy	1.15	1
(3) Bottom layer								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	10	0	0	0	0			

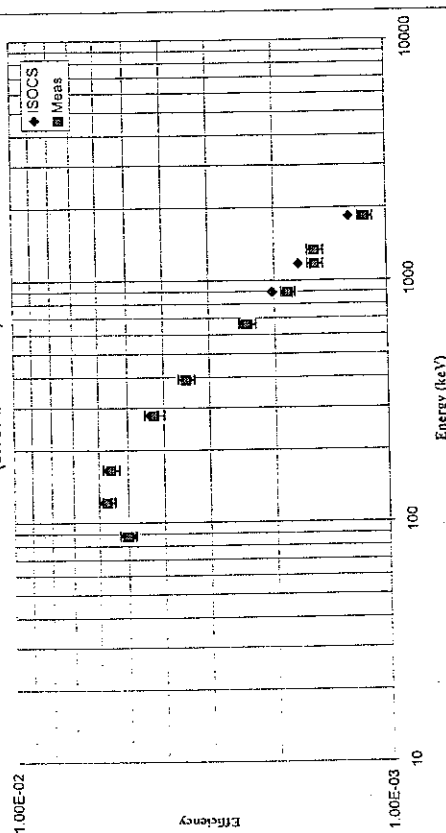
Air. Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: .1 %

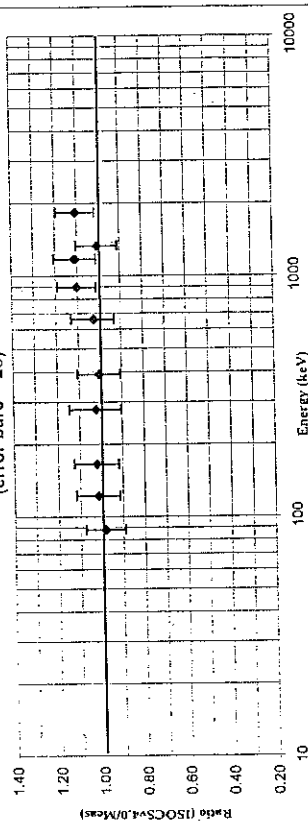
Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%¹⁴H+72.1%C

LAB SOURCE PARALLEL AT 10CM

(error bars = 1 σ)

LAB SOURCE PARALLEL AT 10CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCs efficiency	Measured efficiency	1 σ unc.	2 σ rel. uncert.	Ratio (ISOCs/Measured)
88.03	4.93E-03	5.02E-03	2.34E-04	0.09	0.98
122.06	5.81E-03	5.71E-03	2.89E-04	0.10	1.02
165.85	5.68E-03	5.55E-03	2.88E-04	0.10	1.02
279.16	4.35E-03	4.24E-03	2.56E-04	0.12	1.03
391.69	3.49E-03	3.47E-03	1.74E-04	0.10	1.01
661.65	2.44E-03	2.37E-03	1.19E-04	0.10	1.03
898.02	2.03E-03	1.84E-03	8.07E-05	0.09	1.10
1173.22	1.72E-03	1.55E-03	7.47E-05	0.10	1.11
1332.49	1.56E-03	1.55E-03	7.55E-05	0.10	1.01
1836.01	1.28E-03	1.14E-03	5.03E-05	0.09	1.11
Wt. Mean Ratio					1.00
Dataset					Std. Dev.
<150keV					0.02
>150keV					0.05
All					0.05

125ML BOTTLE, AT 0CM AND PERPENDICULAR TO DET AXIS

Date: August 10, 2000

ISOS Version: v4.0

The source consist of one 125 ml. nalgene bottle 87.5mm long by 50.0mm OD and 1.0mm thick walls.
The activity is uniformly distributed in an epoxy matrix filling the bottle 87.5mm from the inside bottom.
The vial is positioned perpendicular to the detector axis, centered about its active length.

ISOS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.1	4.8	8.75			PolyProp	0.9	
(2) Src. Top Lay.								
(3) Src. Bot Lay.	6.75					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0.00001	0	-1	0	-1			

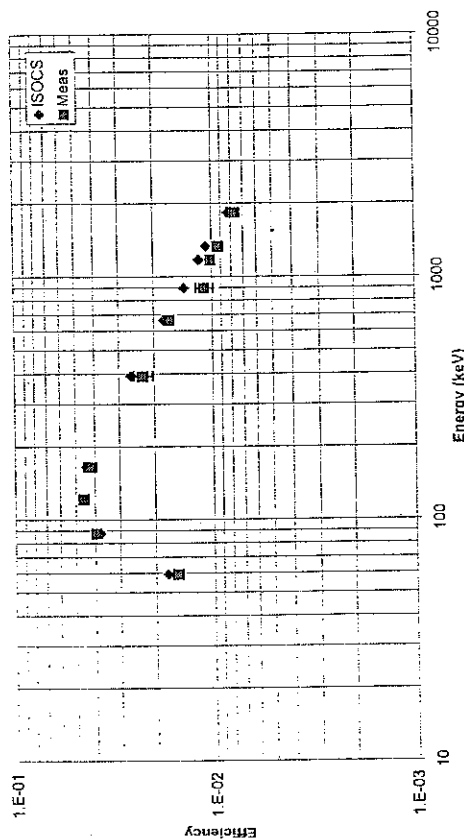
Air: Temp: 20 C Rel. Hum: 50% Bar. Press: 760 mm Hg

Convergence: .1 %

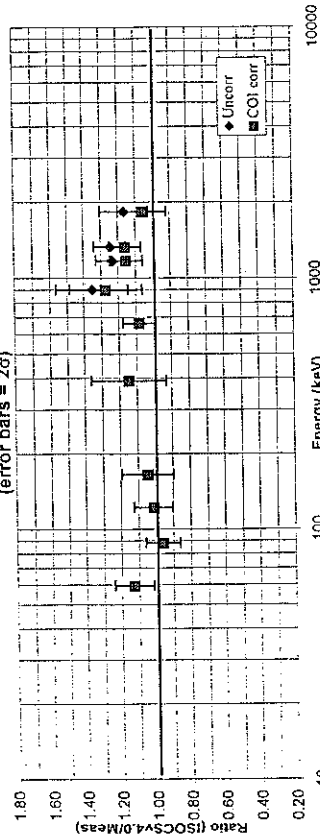
Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%²²H+72.1%¹²C

LAB SOURCE HORIZONTAL AT 0CM

(error bars = 1 σ)

LAB SOURCE HORIZONTAL AT 0CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOS efficiency	COI factor	ISOS eff * COI	efficiency	Measured 1s unc	2s rel. unc	Ratio (ISOS/Meas)	Corr. ratio
59.54	1.75E-02	1	1.75E-02	1.55E-02	8.72E-04	0.11	1.13	1.13
88.03	3.80E-02	1	3.80E-02	3.96E-02	1.98E-03	0.10	0.96	0.96
122.06	4.63E-02	1	4.63E-02	4.57E-02	2.55E-03	0.11	1.01	1.01
165.85	4.43E-02	1	4.43E-02	4.24E-02	3.15E-03	0.15	1.04	1.04
391.69	2.61E-02	1	2.61E-02	2.28E-02	2.46E-03	0.22	1.15	1.15
661.65	1.80E-02	1	1.80E-02	1.66E-02	7.90E-04	0.10	1.08	1.08
898.02	1.49E-02	0.94	1.40E-02	1.10E-02	1.16E-03	0.21	1.35	1.27
1173.22	1.26E-02	0.93	1.18E-02	1.02E-02	4.77E-04	0.09	1.24	1.15
1332.49	1.16E-02	0.93	1.08E-02	9.27E-03	4.33E-04	0.09	1.25	1.16
1836.01	9.14E-03	0.91	8.31E-03	7.84E-03	5.49E-04	0.14	1.17	1.08
Wt. Mean								Isocs
Dataset								Wt. Rel.
<150keV								Std. Dev.
>150keV								Ratio
All								1.02
								1.12
								0.05
								0.08
								0.05

The ISOS efficiencies for Co-60 and Y-88 have been reduced to take into account the coincidence summing losses.

125ML BOTTLE , AT 5CM AND PERPENDICULAR TO DET AXIS

Date: August 10, 2000

ISOCs Version: v4.0

The source consist of one 125 mL nalgene bottle 87.5mm long by 50.0mm OD and 1.0mm thick walls.
The activity is uniformly distributed in an epoxy matrix filling the bottle 87.5mm from the inside bottom.
The bottle is positioned vertically upright. The bottle is centered on the endcap front face.

ISOCs Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (SN 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.1	4.8	8.75			PolyProp	0.9	
(2) Src. Top Lay.								
(3) Src. Bot Lay.	6.75					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	5	0	-1	0	-1			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: .1 %

Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%H+72.1%C

Comparison Results

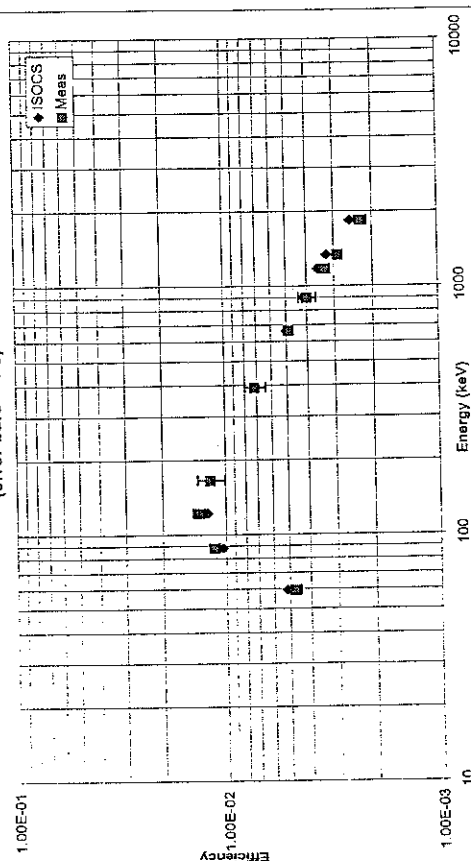
Energy (keV)	ISOCs efficiency	COI factor	ISOCs eff * COI	efficiency	Measured 1 σ unc	2 σ rel. unc	Ratio (ISOCs/Meas)	Ratio	Corr. Ratio
59.54	5.20E-03	1	5.20E-03	4.72E-03	2.65E-04	0.11	1.10	1.10	1.10
88.03	1.04E-02	1	1.04E-02	1.14E-02	5.84E-04	0.10	0.91	0.91	0.91
122.06	1.22E-02	1	1.22E-02	1.34E-02	8.48E-04	0.13	0.91	0.91	0.91
185.85	1.19E-02	1	1.19E-02	1.18E-02	1.72E-03	0.29	1.00	1.00	1.00
391.69	7.18E-03	1	7.18E-03	7.17E-03	8.00E-04	0.22	1.00	1.00	1.00
661.65	5.04E-03	1	5.04E-03	4.90E-03	2.30E-04	0.09	1.03	1.03	1.03
898.02	4.20E-03	0.98	4.12E-03	4.00E-03	3.76E-04	0.19	1.05	1.05	1.03
1173.22	3.62E-03	0.98	3.55E-03	3.28E-03	1.50E-04	0.09	1.10	1.10	1.08
1332.49	3.30E-03	0.98	3.23E-03	2.88E-03	1.32E-04	0.09	1.15	1.15	1.12
1936.01	2.82E-03	0.97	2.55E-03	2.27E-03	1.48E-04	0.13	1.15	1.15	1.12
				Wt. Mean		Ratio	Std. Dev.	Std. Dev.	Std. Dev.
						<150keV	0.96	0.11	0.10
						>150keV	1.07	0.04	0.04
						All	1.03	0.08	0.06

The ISOCs efficiencies for Co-60 and Y-88

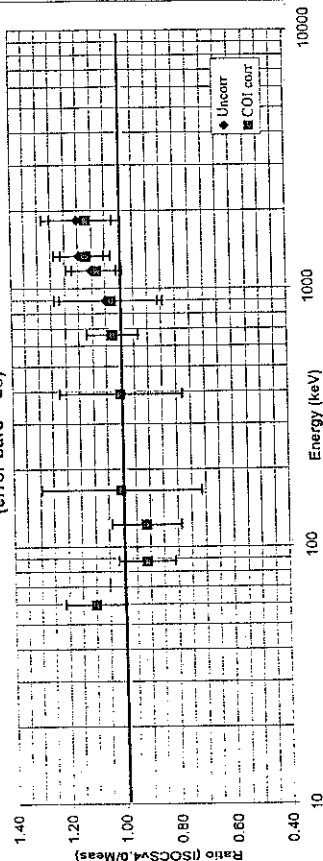
have been reduced to take into account the

coincidence summing losses.

LAB SOURCE HORIZONTAL AT 5CM

(error bars = 1 σ)

LAB SOURCE HORIZONTAL AT 5CM

(error bars = 2 σ)

125ML BOTTLE, AT 10CM AND PERPENDICULAR TO DET AXIS

Date: August 10, 2000 ISOCS Version: v4.0

The source consist of one 125 mL nalgene bottle 87.5mm long by 50.0mm OD and 1.0mm thick walls.
The activity is uniformly distributed in an epoxy matrix filling the bottle 67.5mm from the inside bottom.
The bottle is positioned vertically upright. The bottle is centered on the endcap front face.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.1	4.8	8.75			PolyProp	0.9	
(2) Src. Top Lay.								
(3) Src. Bot Lay.	6.75					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	10	0	-1	0	-1			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

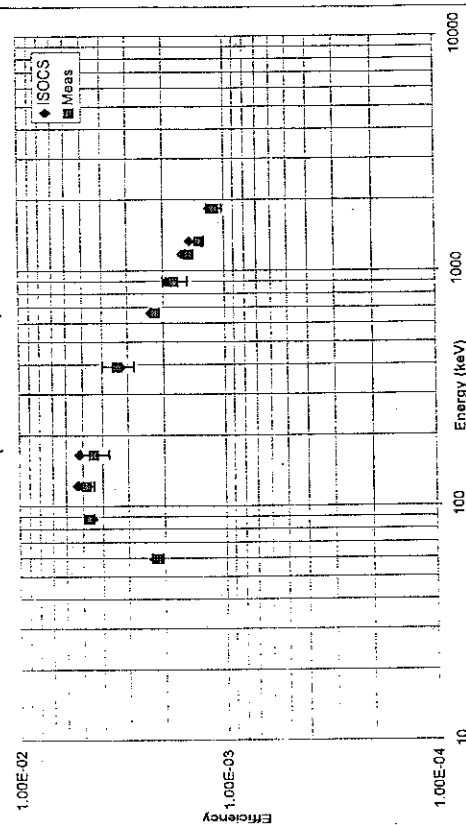
Convergence: .1 %

Units: Length: cm Density: g/cc

Source Material: 21.9%O+8%¹¹⁷2.1%¹³⁷C

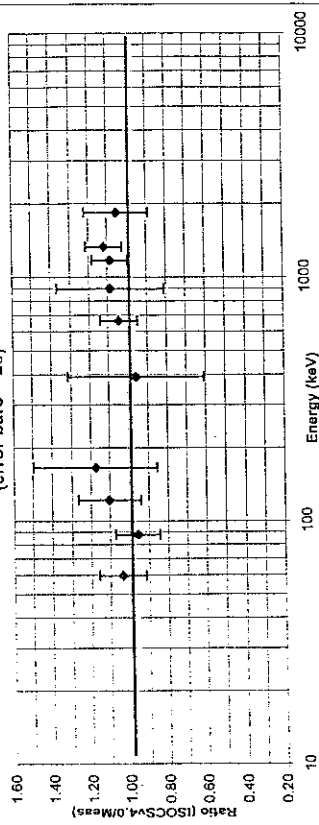
LAB SOURCE HORIZONTAL AT 10CM

(error bars = 1σ)



LAB SOURCE HORIZONTAL AT 10CM

(error bars = 2σ)



Comparison Results

Energy (keV)	ISOCS efficiency	efficiency	Measured 1σ unc	2σ rel. unc	Ratio (ISOCS/Measured)
59.54	2.27E-03	2.19E-03	1.32E-04	0.12	1.04
88.03	4.51E-03	4.70E-03	2.70E-04	0.11	0.96
122.06	5.31E-03	4.81E-03	3.94E-04	0.16	1.10
165.85	5.21E-03	4.43E-03	7.07E-04	0.32	1.18
391.69	3.28E-03	3.38E-03	5.97E-04	0.35	0.98
661.65	2.30E-03	2.20E-03	1.06E-04	0.10	1.05
898.02	1.93E-03	1.77E-03	2.46E-04	0.28	1.09
1173.22	1.62E-03	1.49E-03	7.04E-05	0.09	1.09
1332.49	1.48E-03	1.32E-03	6.26E-05	0.09	1.12
1836.01	1.18E-03	1.12E-03	9.30E-05	0.17	1.06
Wt. Mean					
		Dataset	Ratio	Wt. Rel.	Isocs
		<150keV	1.01	Std. Dev.	Std. Dev.
		>150keV	1.08	0.06	0.06
		All	1.06	0.04	0.04
				0.05	0.05

125ML BOTTLE, AT 25CM AND PERPENDICULAR TO DET AXIS

Date: August 10, 2000 ISOCS Version: v4.0

The source consist of one 125 mL nalgene bottle 87.5mm long by 50.0mm OD and 1.0mm thick walls.
The activity is uniformly distributed in an epoxy matrix filling the bottle 67.5mm from the inside bottom.
The bottle is positioned vertically upright. The bottle is centered on the endcap front face.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (SN 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.1	4.8	8.75			PolyProp	0.9	
(2) Src. Top Lay.								
(3) Src. Bot Lay.	6.75					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	25	0	-1	0	-1			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: .1 %

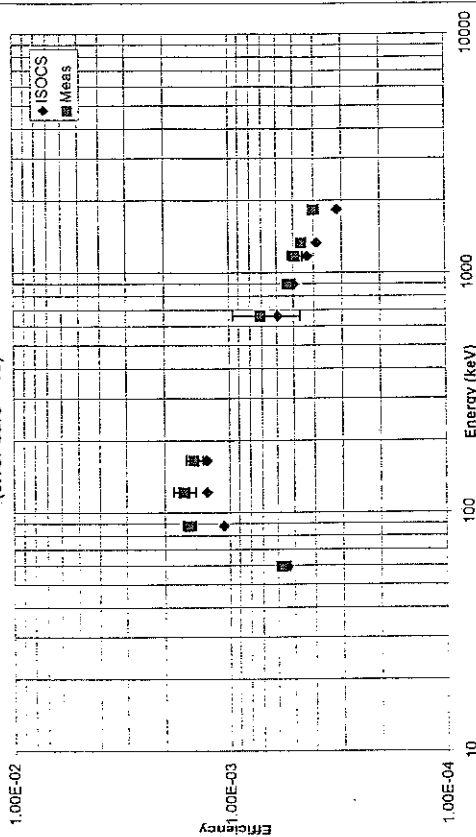
Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%H+72.1%C

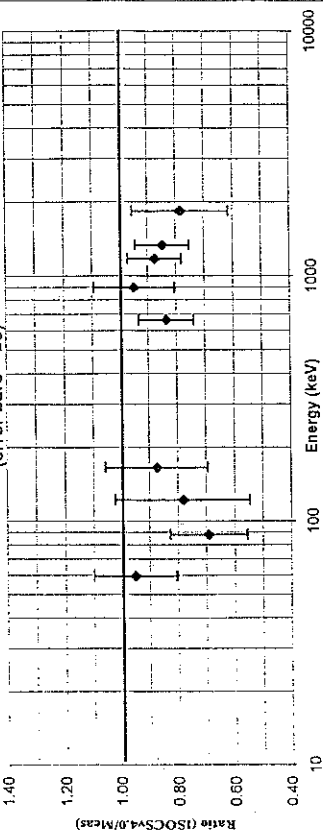
Comparison Results

Energy (keV)	ISOCS efficiency	Measured		Ratio (ISOCS/Measured)
		efficiency	1 σ unc	
59.54	5.42E-04	5.69E-04	4.20E-05	0.15
88.03	1.07E-03	1.55E-03	1.05E-04	0.14
122.06	1.28E-03	1.63E-03	1.94E-04	0.24
165.85	1.28E-03	1.46E-03	1.32E-04	0.18
661.65	5.96E-04	7.12E-04	2.48E-04	0.10
898.02	5.00E-04	5.26E-04	3.44E-05	0.14
1173.22	4.31E-04	4.92E-04	3.78E-05	0.09
1332.49	3.90E-04	4.59E-04	2.31E-05	0.09
1836.01	3.16E-04	4.02E-04	2.15E-05	0.17
Wt. Mean				
		Ratio	Std. Dev.	Isocs Std. Dev.
Dataset				
<150keV		0.77	0.18	0.16
>150keV		0.86	0.05	0.05
All		0.84	0.09	0.07

LAB SOURCE HORIZONTAL AT 25CM

(error bars = 1 σ)

LAB SOURCE HORIZONTAL AT 25CM

(error bars = 2 σ)

125ML BOTTLE END-ON, AT 0CM FROM THE DETECTOR

Date: August 10, 2000

ISOSCS Version: v4.0

The source consist of one 125 mL nalgene bottle 87.5mm long by 50.0mm OD and 1.0mm thick walls.
The activity is uniformly distributed in an epoxy matrix filling the bottle 67.5mm from the inside bottom.
The bottle is positioned vertically upright. The bottle is centered on the endcap front face.

ISOSCS Geometry Parameters

Template: BEAKER

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker	6.75					Epoxy	1.15	1
(2) Top layer								
(3) Bottom layer								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

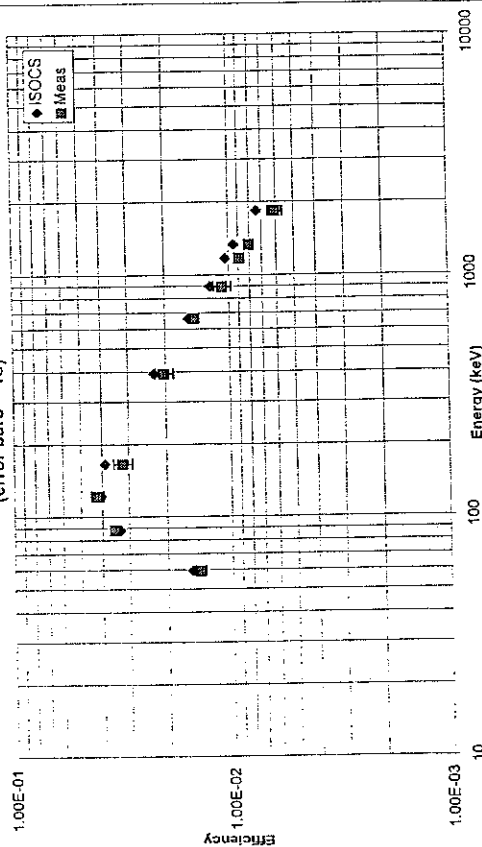
Convergence: 1 %

Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%H+72.1%C

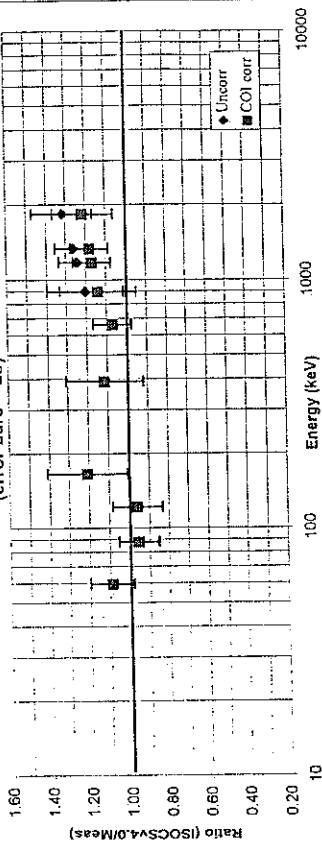
LAB SOURCE VERTICAL AT 0CM

(error bars = 1σ)



LAB SOURCE VERTICAL AT 0CM

(error bars = 2σ)



Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff ± COI	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)	Ratio	Corr. ratio
59.54	1.55E-02	1	1.55E-02	1.42E-02	7.83E-04	0.11	1.09	1.09	1.09
88.03	3.34E-02	1	3.34E-02	3.50E-02	1.76E-03	0.10	0.95	0.95	0.95
122.06	4.05E-02	1	4.05E-02	4.22E-02	2.62E-03	0.12	0.96	0.96	0.96
165.85	3.87E-02	1	3.87E-02	3.20E-02	3.24E-03	0.20	1.21	1.21	1.21
391.69	2.27E-02	1	2.27E-02	2.04E-02	1.98E-03	0.19	1.11	1.11	1.11
661.65	1.56E-02	1	1.56E-02	1.46E-02	7.02E-04	0.10	1.07	1.07	1.07
898.02	1.30E-02	0.95	1.23E-02	1.08E-02	1.04E-03	0.19	1.21	1.21	1.14
1173.22	1.11E-02	0.94	1.04E-02	8.90E-03	4.17E-04	0.09	1.24	1.24	1.17
1332.49	1.01E-02	0.94	9.49E-03	8.04E-03	3.76E-04	0.09	1.26	1.26	1.18
1838.01	8.02E-03	0.92	7.39E-03	6.09E-03	4.66E-04	0.15	1.32	1.32	1.21
				Wt. Mean					
				Dataset	Ratio	Std. Dev.	Std. Dev.		
				<150keV	1.01	0.09	0.08		
				>150keV	1.11	0.08	0.05		
				All	1.08	0.09	0.07		

The ISOCS efficiencies for Co-60 and Y-88

have been reduced to take into account the coincidence summing losses.

125ML BOTTLE END-ON, AT 5CM FROM THE DETECTOR

Date: August 10, 2000

ISOCs Version: v4.0

The source consist of one 125 mL nalgene bottle 87.5mm long by 50.0mm OD and 1.0mm thick walls. The activity is uniformly distributed in an epoxy matrix filling the bottle 87.5mm from the inside bottom. The bottle is positioned vertically upright. The bottle is centered on the endcap front face.

ISOCs Geometry Parameters

Template: BEAKER

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker								
(2) Top layer	6.75					Epoxy	1.15	1
(3) Bottom layer								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	5	0	0	0	0			

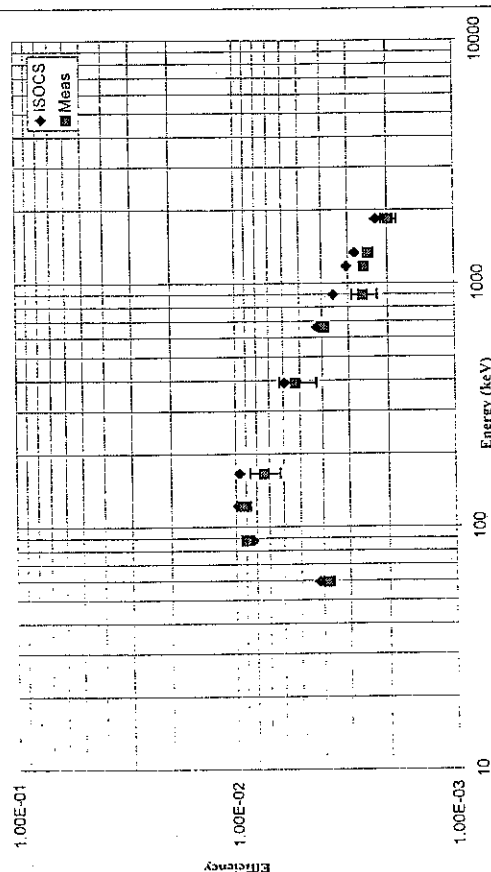
Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1 %

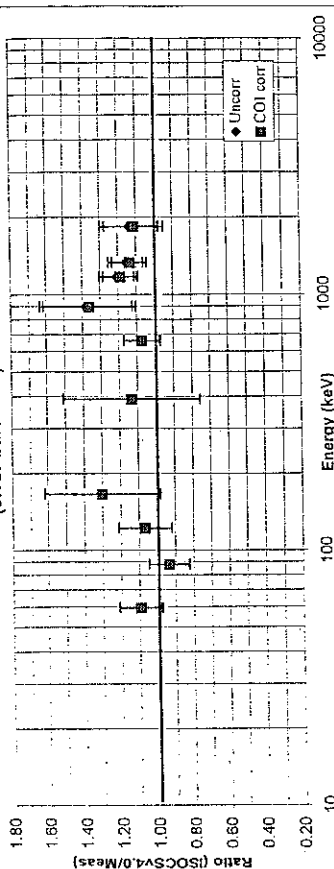
Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%H+72.1%C

LAB SOURCE VERTICAL AT 5CM

(error bars = 1 σ)

LAB SOURCE VERTICAL AT 5CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCs efficiency	COI factor	ISOCs eff * COI	Measured		Ratio (ISOCs/Meas)	Ratio	Corr. ratio
				1 σ unc	2 σ rel. unc			
59.54	4.17E-03	1	4.17E-03	3.81E-03	2.23E-04	0.12	1.10	1.10
88.03	8.35E-03	1	8.35E-03	8.92E-03	4.93E-04	0.11	0.94	0.94
122.06	9.85E-03	1	9.85E-03	9.24E-03	6.72E-04	0.15	1.07	1.07
165.85	9.61E-03	1	9.61E-03	7.39E-03	1.18E-03	0.32	1.30	1.30
391.69	5.93E-03	1	5.93E-03	5.23E-03	9.90E-04	0.38	1.13	1.13
661.65	4.20E-03	1	4.20E-03	3.91E-03	1.95E-04	0.10	1.07	1.07
898.02	3.54E-03	0.98	3.48E-03	2.56E-03	3.29E-04	0.26	1.38	1.36
1173.22	3.05E-03	0.98	3.00E-03	2.53E-03	1.21E-04	0.10	1.21	1.19
1332.49	2.80E-03	0.98	2.75E-03	2.42E-03	1.15E-04	0.10	1.16	1.14
1836.01	2.24E-03	0.98	2.19E-03	1.97E-03	1.59E-04	0.16	1.14	1.11
							Wt. Mean	Isocs
							Ratio	Std. Dev.
							Dataset	Std. Dev.
							<150keV	0.09
							>150keV	0.06
							All	0.06

The ISOCs efficiencies for Co-60 and Y-88

have been reduced to take into account the

coincidence summing losses.

125ML BOTTLE END-ON, AT 10CM FROM THE DETECTOR

Date: August 10, 2000

ISOCS Version: v4.0

The source consist of one 125 mL naigene bottle 87.5mm long by 50.0mm OD and 1.0mm thick walls.
The activity is uniformly distributed in an epoxy matrix filling the bottle 87.5mm from the inside bottom.
The bottle is positioned vertically upright. The bottle is centered on the endcap front face.

ISOCS Geometry Parameters

Template: BEAKER

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker								
(2) Top layer	6.75					Epoxy	1.15	1
(3) Bottom layer								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	10	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

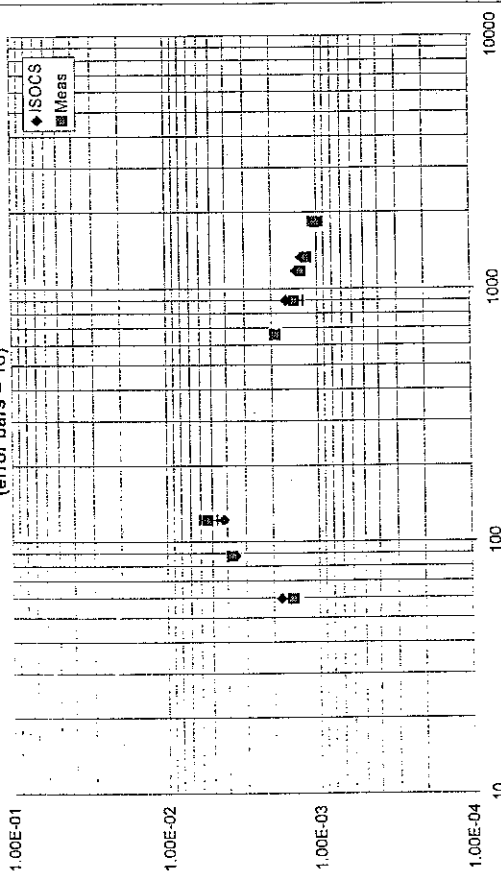
Convergence: .1 %

Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%⁶H+72.1%¹²C

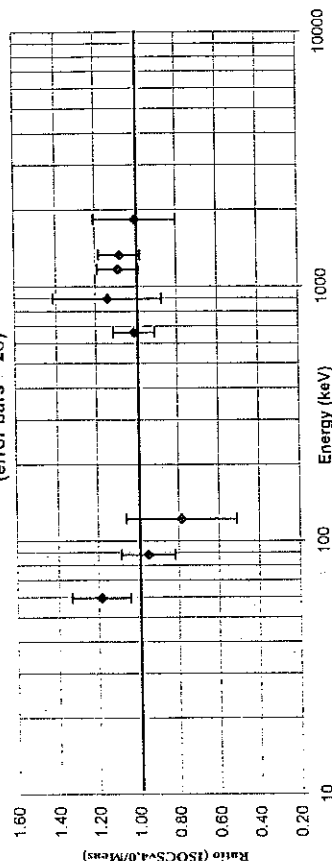
LAB SOURCE VERTICAL AT 10CM

(error bars = 1σ)



LAB SOURCE VERTICAL AT 10CM

(error bars = 2σ)



Comparison Results

Energy (keV)	ISOCS efficiency	Measured		Ratio (ISOCS/Measured)	Wt. Mean	Dataset	Wt. Rel. Ratio	Std. Dev.	Std. Dev.	Isocs
		efficiency	1 σ unc	2 σ rel. unc						
59.54	1.78E-03	1.50E-03	1.10E-04	0.15	1.19	<150keV	0.99	0.17	0.15	
88.03	3.56E-03	3.73E-03	2.52E-04	0.14	0.95	>150keV	1.06	0.04	0.04	
122.06	4.23E-03	5.38E-03	7.40E-04	0.28	0.79	All	1.04	0.09	0.06	
661.65	1.93E-03	1.90E-03	9.79E-05	0.10	1.01					
898.02	1.63E-03	1.42E-03	1.91E-04	0.27	1.14					
1173.22	1.38E-03	1.27E-03	6.45E-05	0.10	1.09					
1332.49	1.27E-03	1.17E-03	5.96E-05	0.10	1.08					
1836.01	1.03E-03	1.02E-03	1.04E-04	0.20	1.01					

125ML BOTTLE END-ON, AT 25CM FROM THE DETECTOR

Date: August 10, 2000

ISOCSS Version: v4.0

The source consist of one 125 mL nalgene bottle 87.5mm long by 50.0mm OD and 1.0mm thick walls. The activity is uniformly distributed in an epoxy matrix filling the bottle 67.5mm from the inside bottom. The bottle is positioned vertically upright. The bottle is centered on the endcap front face.

ISOCSS Geometry Parameters

Template: BEAKER

Detector: 42% (SN 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker						Container dimensions from the file 125mL_BKR		
(2) Top layer	6.75					Epoxy	1.15	1
(3) Bottom layer								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	25	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

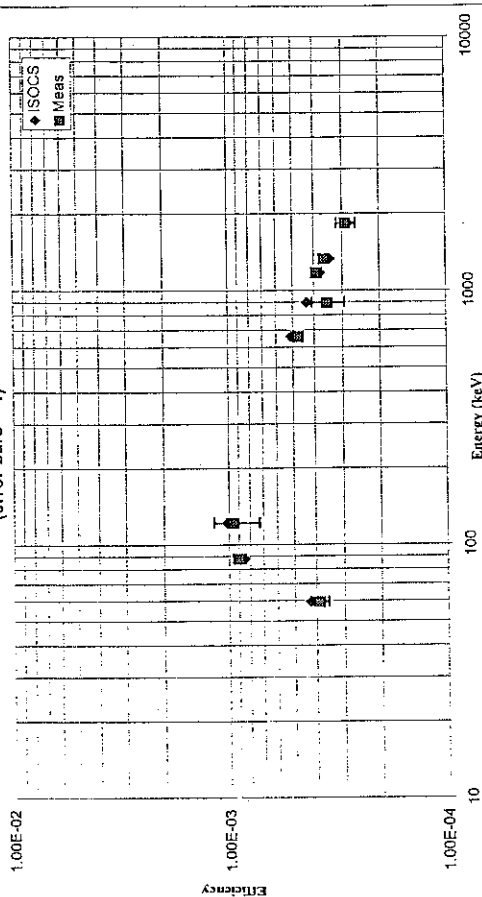
Convergence: .1 %

Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%H+72.1%C

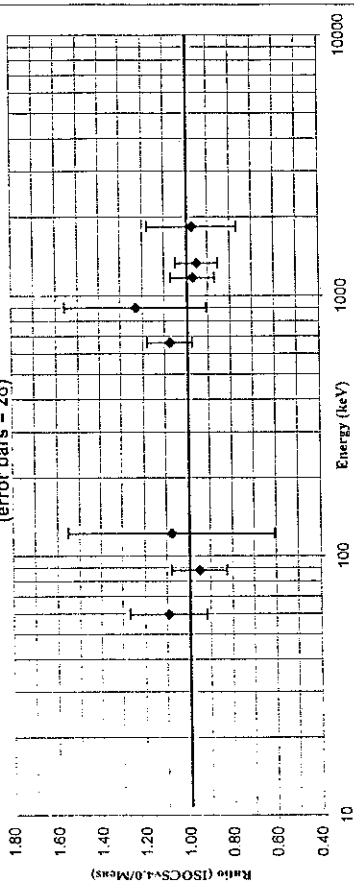
LAB SOURCE VERTICAL AT 25CM

(error bars = 1)



LAB SOURCE VERTICAL AT 25CM

(error bars = 2σ)



Comparison Results

Energy (keV)	ISOCSS efficiency	Measured efficiency	1 σ unc	2σ rel. unc	Ratio (ISOCSS/Measured)
59.54	4.27E-04	3.90E-04	3.44E-05	0.18	1.08
88.03	8.54E-04	8.97E-04	5.68E-05	0.13	0.95
122.06	1.03E-03	9.63E-04	2.25E-04	0.47	1.08
661.65	5.11E-04	4.74E-04	2.41E-05	0.10	1.08
898.02	4.33E-04	3.51E-04	5.71E-05	0.33	1.23
1173.22	3.78E-04	3.89E-04	1.94E-05	0.10	0.97
1332.49	3.43E-04	3.60E-04	1.72E-05	0.10	0.95
1836.01	2.81E-04	2.89E-04	2.96E-05	0.21	0.97
Wt. Mean					
Ratio					
Dataset					
<150keV					Std. Dev. 0.08
>150keV					Std. Dev. 0.03
All					Std. Dev. 0.07

FILTER PAPER IN PETRI DISH, 0CM FROM THE DETECTOR

Date: August 10, 2000 ISOCS Version: v4.0

The source is 47.0 mm OD by 0.5 mm thick filter in Gelman Petri. The filter is incased in plastic 1mm thick. The top is 56.9mm OD. The middle cylinder is 52.0mm OD by 5mm height, the bottom is 54.1mm OD. The bottom of the petri is parallel to the endcap front face. The petri is centered on the endcap front face.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

Detector: 42% (SN 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.1	4.7				PolyProp	0.9	
(2) Lay 1	0.1					PolyProp	0.9	
(3) Lay 2	0.05					Cellulose	0.13	1
(4-11) Lay 3-10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	0.00001	0	0	0	0			

Air Temp: 20 C Rel Hum: 50% Bar. Press.: 760 mm Hg

Convergence: .1%

Units: Length: cm Density: g/cc

Source Material: H10_C6_O5

Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff * COI	efficiency	Measured 1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)	Ratio	Corr. ratio
59.54	6.03E-02	1	6.03E-02	4.57E-02	2.40E-03	0.11	1.32	1.32	1.32
88.03	1.40E-01	1	1.40E-01	1.32E-01	6.38E-03	0.10	1.06	1.06	1.06
122.06	1.71E-01	1	1.71E-01	1.64E-01	8.13E-03	0.10	1.04	1.04	1.04
165.85	1.61E-01	1	1.61E-01	1.45E-01	7.64E-03	0.11	1.11	1.11	1.11
391.69	8.68E-02	1	8.68E-02	7.28E-02	5.60E-03	0.15	1.19	1.19	1.19
661.65	5.58E-02	1	5.58E-02	5.00E-02	2.34E-03	0.09	1.12	1.12	1.12
898.02	4.44E-02	0.84	3.73E-02	2.91E-02	2.74E-03	0.19	1.52	1.52	1.28
1173.22	3.64E-02	0.82	2.97E-02	2.60E-02	1.21E-03	0.09	1.40	1.40	1.14
1332.49	3.28E-02	0.80	2.64E-02	2.39E-02	1.11E-03	0.09	1.37	1.37	1.10
1836.01	2.60E-02	0.76	1.97E-02	1.92E-02	1.37E-03	0.14	1.35	1.35	1.03
Wt. Mean Ratio									1.15
Dataset Ratio									1.12
Std. Dev.									0.15
Std. Dev.									0.05
All									0.05

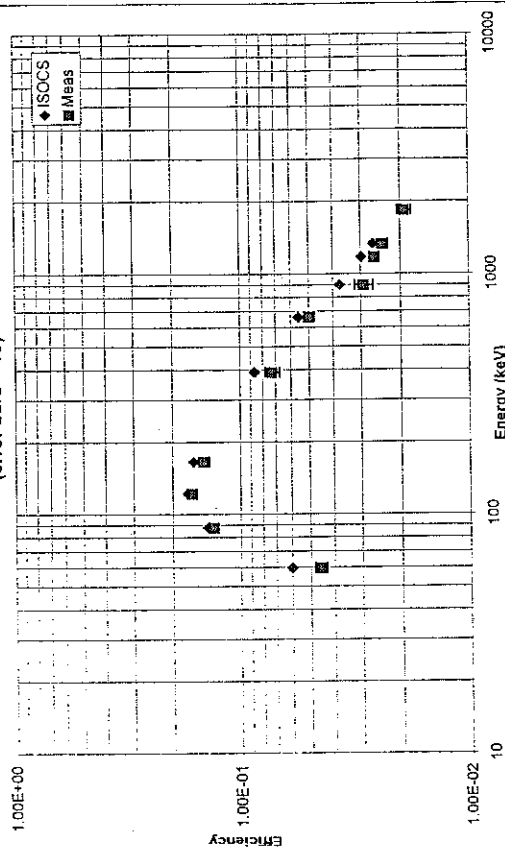
The ISOCS efficiencies for Co-60 and Y-88

have been reduced to take into account the

coincidence summing losses.

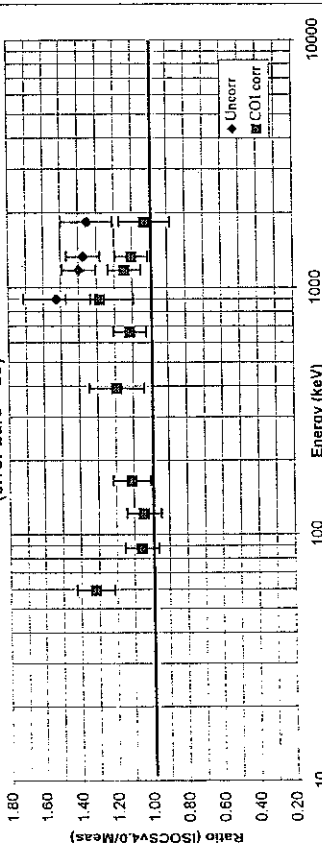
LAB SOURCE ON ENDCAP

(error bars = 1 σ)



LAB SOURCE ON ENDCAP

(error bars = 2 σ)



FILTER PAPER IN PETRI DISH, 5CM FROM THE DETECTOR

Date: August 10, 2000 ISOCS Version: v4.0

The source is 47.0 mm OD by 0.5 mm thick filter in Gelman Petri. The filter is incased in plastic 1mm thick. The top is 56.9mm OD, The middle cylinder is 52.0mm OD by 5mm height, the bottom is 54.1mm OD. The bottom of the petri is parallel to the endcap front face. The petri is centered on the endcap front face.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.1	4.7				PolyProp	0.9	
(2) Lay 1	0.1					PolyProp	0.9	1
(3) Lay 2	0.05					Cellulose	0.13	
(4-11) Lay 3-10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	5	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1 %

Units: Length: cm Density: g/cc

Source Material: H10_C6_O5

Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff * COI	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)	Ratio	Corr. ratio
59.54	1.29E-02	1	1.29E-02	1.08E-02	5.57E-04	0.11	1.22	1.22	1.22
88.03	2.52E-02	1	2.52E-02	2.45E-02	1.21E-03	0.10	1.03	1.03	1.03
122.06	2.89E-02	1	2.89E-02	2.75E-02	1.44E-03	0.10	1.05	1.05	1.05
165.85	2.70E-02	1	2.70E-02	2.11E-02	1.65E-03	0.16	1.28	1.28	1.28
391.69	1.48E-02	1	1.48E-02	1.32E-02	1.12E-03	0.17	1.12	1.12	1.12
661.65	1.01E-02	1	1.01E-02	8.75E-03	4.12E-04	0.09	1.16	1.16	1.16
898.02	8.22E-03	0.97	7.95E-03	6.52E-03	5.49E-04	0.17	1.26	1.26	1.22
1173.22	6.96E-03	0.96	6.72E-03	5.52E-03	2.55E-04	0.09	1.26	1.26	1.22
1332.49	6.37E-03	0.96	6.13E-03	5.00E-03	2.30E-04	0.09	1.27	1.27	1.23
1836.01	4.93E-03	0.96	4.71E-03	3.78E-03	2.49E-04	0.13	1.30	1.30	1.25

The ISOCS efficiencies for Co-60 and Y-88

have been reduced to take into account the

coincidence summing losses.

Wt. Mean

Ratio

Dataset

<150keV

>150keV

All

Wt. Rel.

Std. Dev.

Ratio

1.10

1.18

1.16

0.12

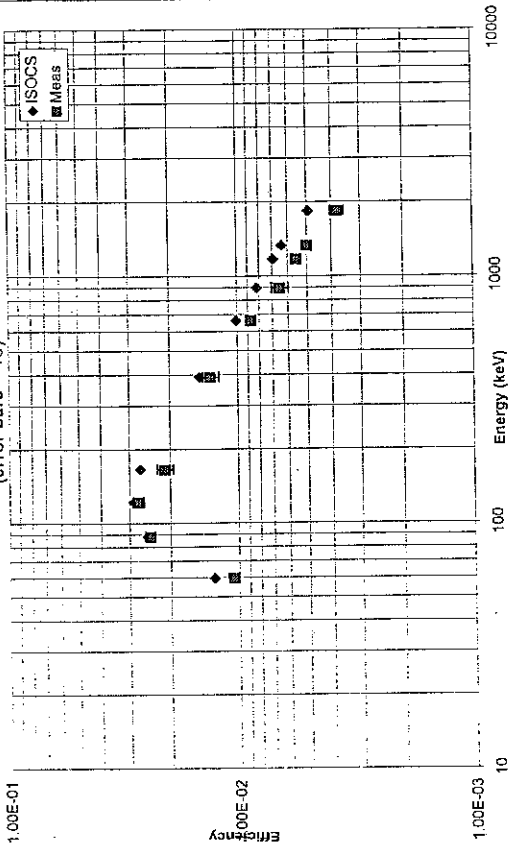
0.07

0.08

0.05

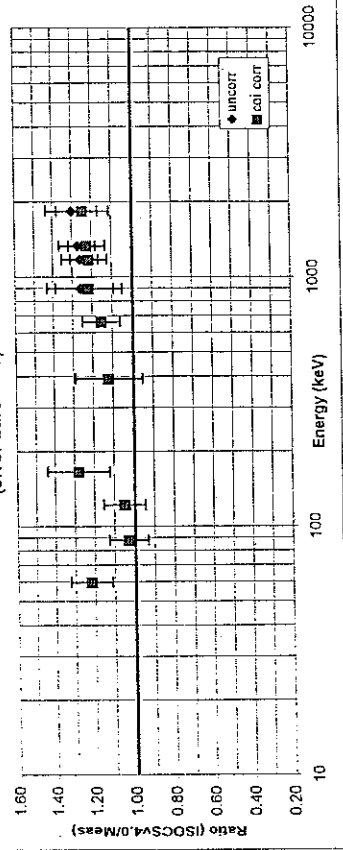
LAB SOURCE 5CM FROM ENDCAP

(error bars = 1 σ)



LAB SOURCE 5CM FROM ENDCAP

(error bars = 2 σ)



FILTER PAPER IN PETRI DISH, 25CM FROM THE DETECTOR

Date: August 10, 2000 ISOCS Version: v4.0

The source is 47.0 mm OD by 0.5 mm thick filter in Gelman Petri. The filter is incased in plastic 1mm thick. The top is 56.9mm OD. The middle cylinder is 52.0mm OD by 5mm height, the bottom is 54.1mm OD. The bottom of the petri is parallel to the endcap front face. The petri is centered on the endcap front face.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.1	4.7				PolyProp	0.9	
(2) Lay 1	0.1					PolyProp	0.9	
(3) Lay 2	0.05					Cellulose	0.13	1
(4-11) Lay 3-10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	25	0	0	0	0			

Air Temp: 20 C Rel Hum: 50% Bar. Press: 760 mm Hg

Convergence: .1 %

Units: Length: cm Density: g/cc

Source Material: H10_C6_O5

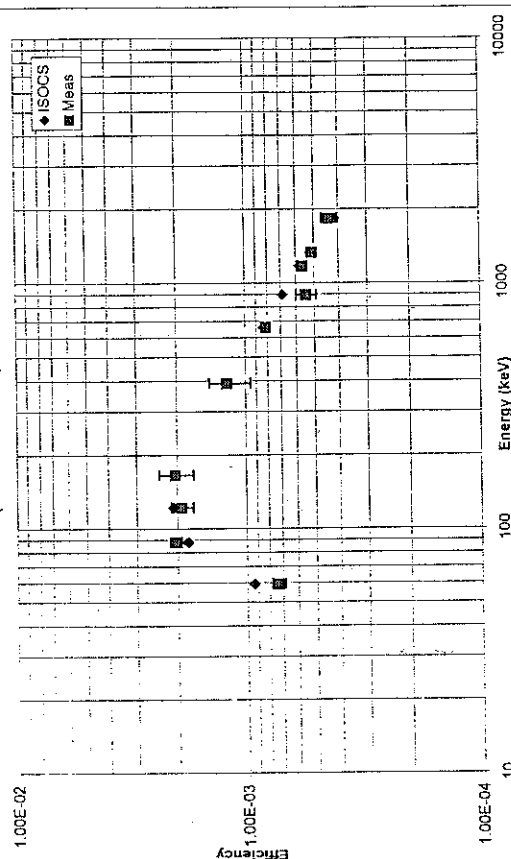
Comparison Results

Energy (keV)	ISOCS efficiency	Measured		Ratio (ISOCS/Measured)
		efficiency	1 σ unc 2 σ rel. unc	
59.54	9.39E-04	7.34E-04	4.65E-05 1.27E-01	1.28
88.03	1.80E-03	2.04E-03	1.17E-04 1.15E-01	0.88
122.06	2.09E-03	1.92E-03	2.12E-04 2.21E-01	1.09
165.85	2.03E-03	2.04E-03	3.37E-04 3.30E-01	1.00
391.69	1.21E-03	1.20E-03	2.48E-04 4.13E-01	1.01
661.65	8.39E-04	8.15E-04	3.88E-05 9.62E-02	1.03
899.02	6.86E-04	5.44E-04	5.37E-05 1.97E-01	1.26
1173.22	5.80E-04	5.63E-04	2.62E-05 9.31E-02	1.03
1332.49	5.20E-04	5.12E-04	2.34E-05 9.14E-02	1.02
1836.01	4.14E-04	4.35E-04	3.18E-05 1.46E-01	0.95

Dataset	Wt Mean		Isocs	
	Ratio	Std. Dev.	Ratio	Std. Dev.
<150keV	1.00	0.25	0.24	
>150keV	1.03	0.06	0.06	
All	1.02	0.10	0.08	

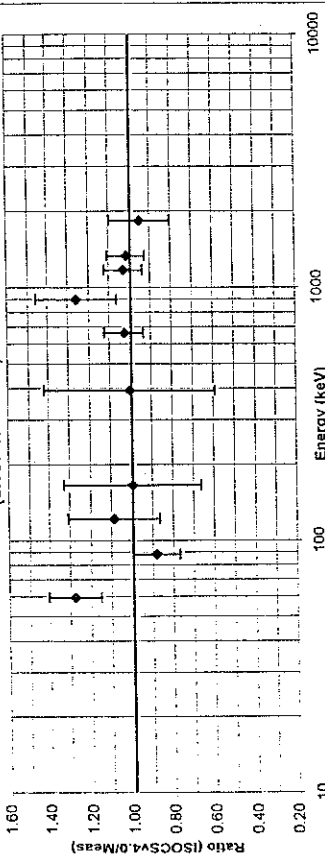
LAB SOURCE 25CM FROM ENDCAP

(error bars = 1 σ)



LAB SOURCE 25CM FROM ENDCAP

(error bars = 2 σ)



This is a Certified Nuclear Reference Material. The certified U235/U mass % is 0.3166. The source is a cylinder with a diameter of 8 cm and a height of 9 cm. The height of Uranium filling is 2.08 cm.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE
42% (S/N 3578). New Characterization

Collimator: NONE

Collimator: NONE	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
	7							
(1) Side Wall	0.5					Al	2.7	0
(2) Src - Lr 1	0.2					Al	2.7	1
(3) Src - Lr 2	2.08					Uoxide	2.4998	
(4) Src - Lr3	6.72					Al	2.7	
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	80.9	0	0	0	0			

Air Temp: 20 C Rel Hum: 50% Bar. Press.: 760 mm Hg

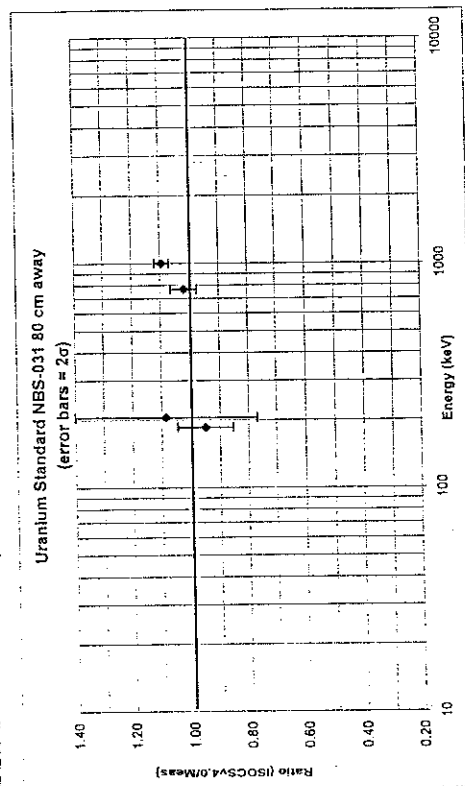
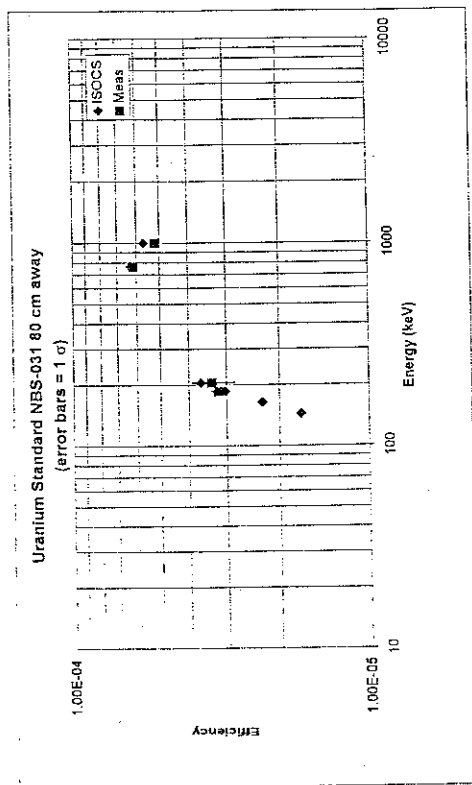
Convergence: 0.1%

Convergence: 0.178
Units: Length: cm Density: g/cc

Source Material: 113-08

Comparison Results

Comparison Results				Ratio	
Energy (keV)	ISOCs efficiency	Measured 1 σ unc	2 σ rel. unc	(ISOCs/Meas)	
143.79	1.69E-05				
163.38	2.29E-05				
185.74	3.03E-05	1.53E-06	9.57E-02		0.95
205.33	3.65E-05	5.30E-06	3.16E-01		1.09
766.41	6.29E-05	1.39E-08	4.47E-02		1.02
1001	5.68E-05	6.45E-07	2.49E-02		1.10
				Wt. Mean	Wt. Rel. ISOCs
			Dataset	Ratio	Std Dev
			<150 keV	1.07	0.048
			>150 keV	1.07	0.043
			All	1.07	0.043



URANIUM STANDARD NBS-031 30CM AWAY

Date: August 10, 2000

ISOCS Version: v4.0

This is a Certified Nuclear Reference Material. The certified U235/U mass % is 0.3166. The source is a cylinder with a diameter of 8 cm and a height of 9 cm. The height of Uranium filling is 2.08 cm.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.5	7				Al	2.7	
(2) Src - Lr 1	0.2					Al	2.7	0
(3) Src - Lr 2	2.08					Uoxide	2.4998	1
(4) Src - Lr3	6.72					Al	2.7	
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	30.9	0	0	0	0			

Air Temp: 20 C Rel Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

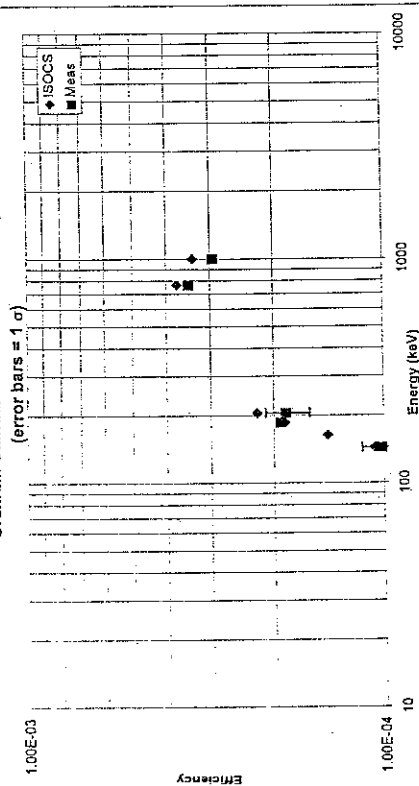
Source Material: U3_O8

Comparison Results

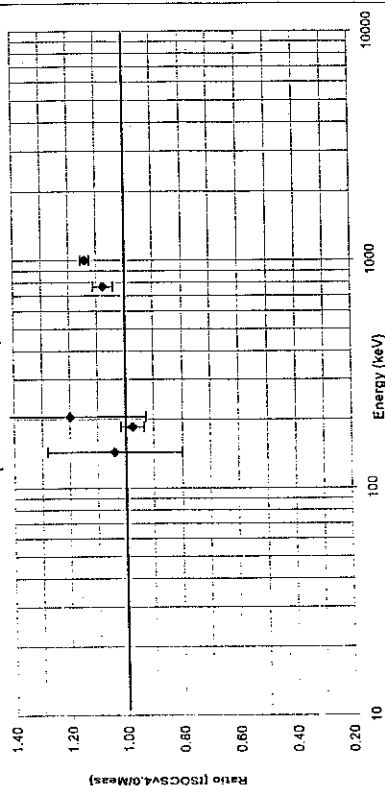
Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)
143.79	1.06E-04	1.02E-04	1.22E-05	2.40E-01	1.04
163.38	1.42E-04	1.91E-04	3.97E-06	4.15E-02	0.98
185.74	1.87E-04	1.86E-04	2.54E-05	2.73E-01	1.20
205.33	2.23E-04	3.46E-04	6.10E-06	3.53E-02	1.08
766.41	3.73E-04	2.96E-04	2.40E-06	1.63E-02	1.14
1001	3.37E-04				

Dataset	Ratio	Wt. Mean	Std Dev	Wt. Rel. ISOCS
<150 keV	1.11		0.058	0.056
>150 keV	1.11		0.058	0.056
All	1.11		0.058	0.056

Uranium Standard NBS-031 30 cm away

(error bars = 1 σ)

Uranium Standard NBS-031 30 cm away

(error bars = 2 σ)

URANIUM STANDARD NBS-071 80CM AWAY

Date: August 10, 2000

ISOCSS Version: v4.0

This is a Certified Nuclear Reference Material. The certified U235/U mass % is 0.7119. The source is a cylinder with a diameter of 8 cm and a height of 9 cm. The height of Uranium filling is 2.08 cm.

ISOCSS Geometry Parameters

Template: CIRCULAR PLANE

42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.5	7				Al	2.7	0
(2) Src - Lr 1	0.2					Al	2.7	1
(3) Src - Lr 2	2.08					Uoxide	2.4998	1
(4) Src - Lr 3	6.72					Al	2.7	
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	80.9	0	0	0	0			

Air: Temp: 20 C Rel Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

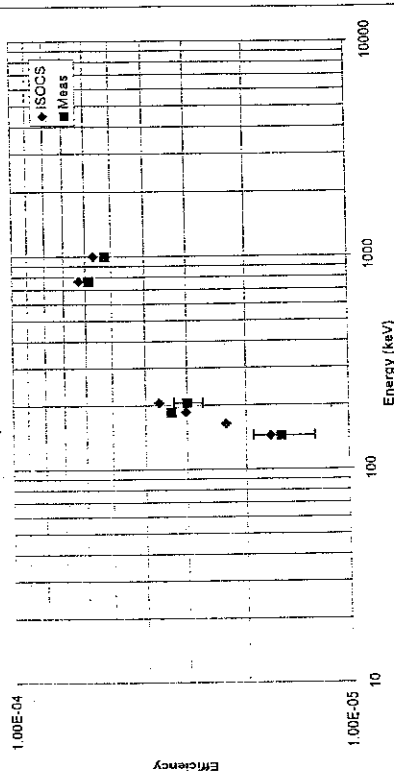
Units: Length: cm Density: g/cc

Source Material: U3_O8

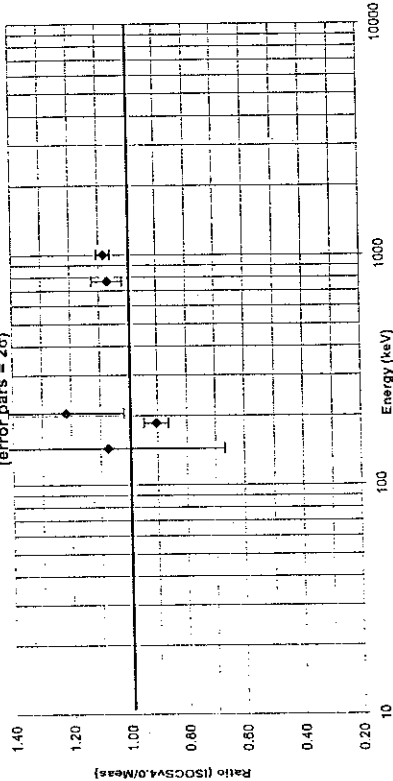
Comparison Results

Energy (keV)	ISOCSS efficiency	Measured efficiency	1 σ unc	2 σ rel unc	Ratio (ISOCSS/Meas)
143.79	1.69E-05	1.58E-05	3.21E-06	4.07E-01	1.07
163.38	2.29E-05	3.35E-05	6.94E-07	4.14E-02	0.91
185.74	3.03E-05	3.00E-05	2.98E-06	1.99E-01	1.22
205.33	3.65E-05	5.87E-05	1.52E-06	5.16E-02	1.07
766.41	6.29E-05	5.24E-05	5.84E-07	2.23E-02	1.08
1001	5.68E-05				
Wt. Mean					Ratio
Dataset					Std Dev
<150 keV					1.04
>150 keV					0.083
All					0.083

Uranium Standard NBS-071 80 cm away
(error bars = 1 σ)



Uranium Standard NBS-071 80 cm away
(error bars = 2 σ)



URANIUM STANDARD NBS-071 30CM AWAY

Date: August 10, 2000

ISOCSS Version: v4.0

This is a Certified Nuclear Reference Material. The certified U235/U mass % is 0.7119. The source is a cylinder with a diameter of 8 cm and a height of 9 cm. The height of Uranium filling is 2.08 cm.

ISOCSS Geometry Parameters

Template: CIRCULAR PLANE

42% (S/N 3578), New Characterization

Collimator: NONE

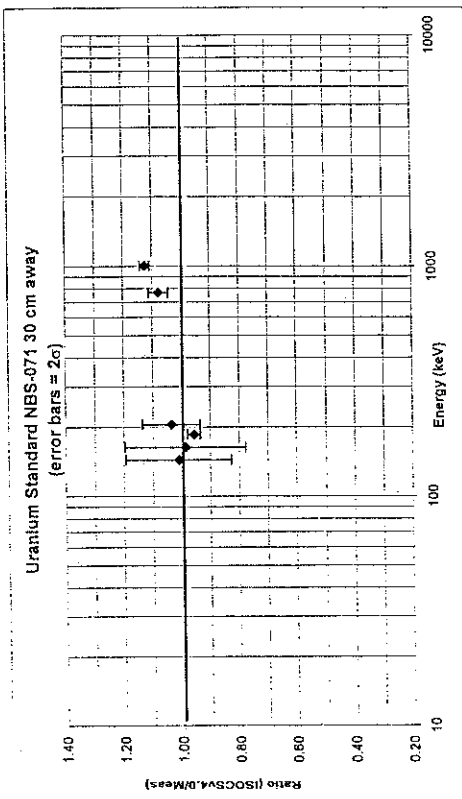
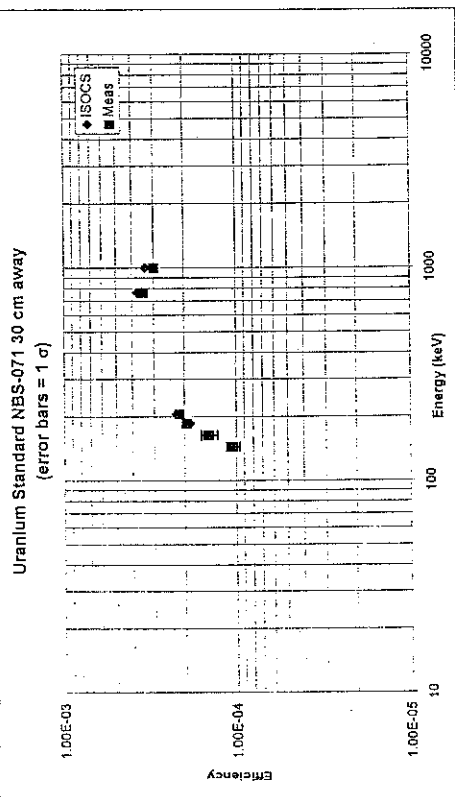
Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.5	7				Al	2.7	
(2) Src - Lr 1	0.2					Al	2.7	0
(3) Src - Lr 2	2.08					Uoxide	2.4998	1
(4) Src - Lr 3	6.72					Al	2.7	
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	31.3	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

Source Material: U3_O8



Comparison Results

Energy (keV)	ISOCSS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCSS/Meas)
143.79	1.06E-04	1.05E-04	9.53E-06	1.82E-01	1.01
163.38	1.42E-04	1.44E-04	1.52E-05	2.10E-01	0.99
185.74	1.87E-04	1.95E-04	2.21E-05	2.26E-02	0.96
205.33	2.23E-04	2.15E-04	1.07E-05	9.97E-02	1.04
766.41	3.73E-04	3.46E-04	5.92E-06	3.43E-02	1.08
1001	3.37E-04	3.00E-04	2.46E-06	1.64E-02	1.13
Wt. Mean Ratio					1.06
Std Dev					0.080
Dataset					<150 keV
					>150 keV
					All
					1.06
					0.079
					0.079

URANIUM STANDARD NBS-194 80CM AWAY

Date: August 10, 2000 ISOCS Version: v4.0

This is a Certified Nuclear Reference Material. The certified U235/U mass % is 1.9420. The source is a cylinder with a diameter of 8 cm and a height of 9 cm. The height of Uranium filling is 2.08 cm.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

42% (SN 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.5	7				Al	2.7	
(2) Src - Lr 1	0.2					Al	2.7	0
(3) Src - Lr 2	2.08					Uoxide	2.4998	1
(4) Src - Lr3	6.72					Al	2.7	
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	80.9	0	0	0	0			

Air: Temp: 20 C Rel. Hum: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

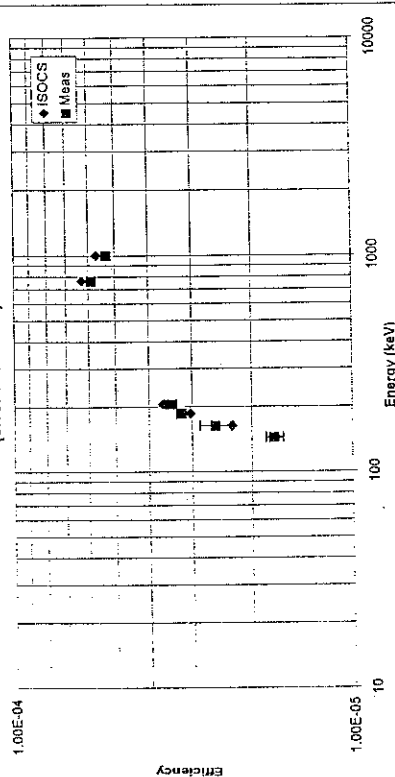
Source Material: U3_O8

Comparison Results

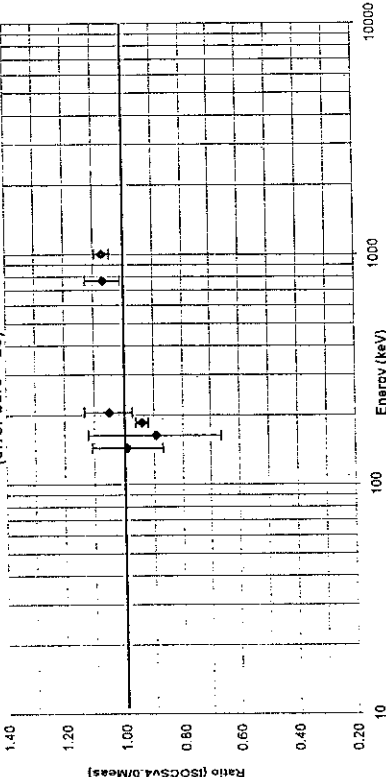
Energy (keV)	ISOCS efficiency	Measured		Ratio (ISOCS/Meas)
		efficiency	1 σ unc. 2 σ rel. unc.	
143.79	1.69E-05	1.71E-05	1.02E-06 1.18E-01	0.99
163.38	2.29E-05	2.57E-05	2.93E-06 2.29E-01	0.89
185.74	3.03E-05	3.23E-05	3.15E-07 1.95E-02	0.94
205.33	3.65E-05	3.47E-05	1.41E-06 8.14E-02	1.05
766.41	6.29E-05	5.89E-05	1.71E-06 5.80E-02	1.07
1001	5.68E-05	5.30E-05	6.43E-07 2.42E-02	1.07

Dataset	Wt. Rel. ISOCS	
	Ratio	Std Dev
<150 keV	0.99	0.070
>150 keV	0.99	0.070
All	0.99	0.067

Uranium Standard NBS-194 80 cm away

(error bars = 1 σ)

Uranium Standard NBS-194 80 cm away

(error bars = 2 σ)

URANIUM STANDARD NBS-194 30CM AWAY

Date: August 10, 2000

ISOCs Version: v4.0

This is a Certified Nuclear Reference Material. The certified U235/U mass % is 1.9420. The source is a cylinder with a diameter of 8 cm and a height of 9 cm. The height of Uranium filling is 2.08 cm.

ISOCs Geometry Parameters

Template: CIRCULAR PLANE

42% (SIN 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.5	7				Al	2.7	
(2) Src - Lr 1	0.2					Al	2.7	0
(3) Src - Lr 2	2.08					Uoxide	2.4998	1
(4) Src - Lr 3	6.72					Al	2.7	
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	30.7	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

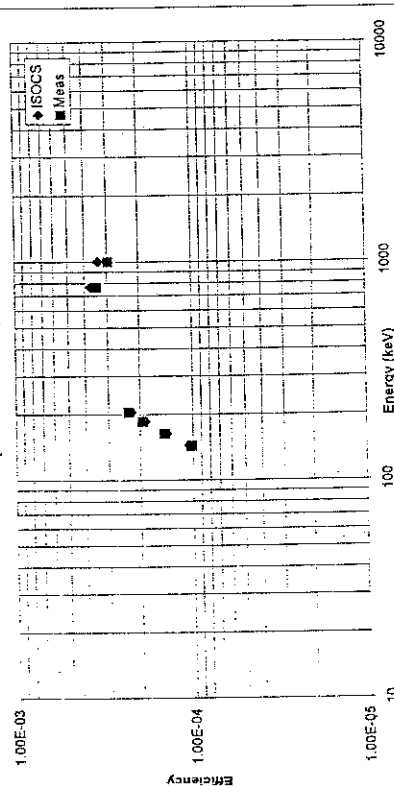
Source Material: U3_O8

Comparison Results

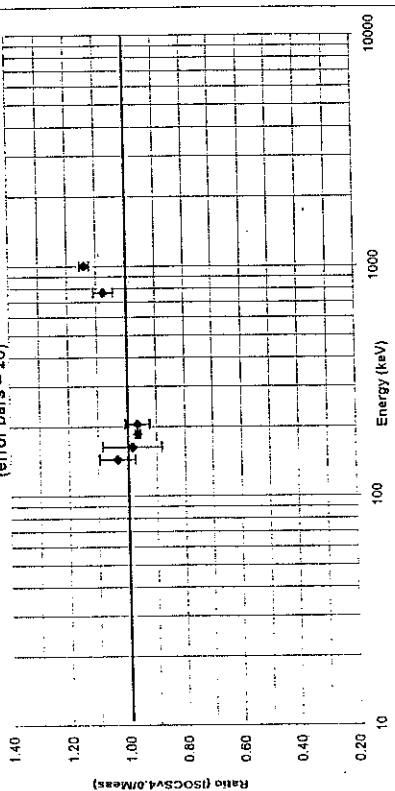
Energy (keV)	ISOCs efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCs/Meas)
143.79	1.08E-04	1.02E-04	3.15E-06	6.16E-02	1.03
163.38	1.42E-04	1.45E-04	7.31E-06	1.01E-01	0.98
185.74	1.87E-04	1.94E-04	9.84E-07	1.02E-02	0.95
205.33	2.23E-04	2.31E-04	4.77E-06	4.14E-02	0.97
766.41	3.73E-04	3.46E-04	5.91E-06	3.41E-02	1.08
1001	3.37E-04	2.96E-04	2.44E-06	1.65E-02	1.14

Dataset	Ratio	Wt. Mean	Wt. Rel. ISOCs
<150 keV	1.00	Std Dev	Std Dev
>150 keV	1.00	0.077	0.076
All	1.00	0.077	0.076

Uranium Standard NBS-194 30 cm away
(error bars = 1 σ)



Uranium Standard NBS-194 30 cm away
(error bars = 2 σ)



URANIUM STANDARD NBS-295 80CM AWAY

Date: August 10, 2000

ISOCs Version: v4.0

This is a Certified Nuclear Reference Material. The certified U235/U mass % is 2.9492. The source is a cylinder with a diameter of 8 cm and a height of 9 cm. The height of Uranium filling is 2.08 cm.

ISOCs Geometry Parameters

Template: CIRCULAR PLANE

42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.5	7				Al	2.7	
(2) Src - Lr 1	0.2					Al	2.7	0
(3) Src - Lr 2	2.08					Uoxide	2.4998	1
(4) Src - Lr3	6.72					Al	2.7	
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	81.3	0	0	0	0			

Air. Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

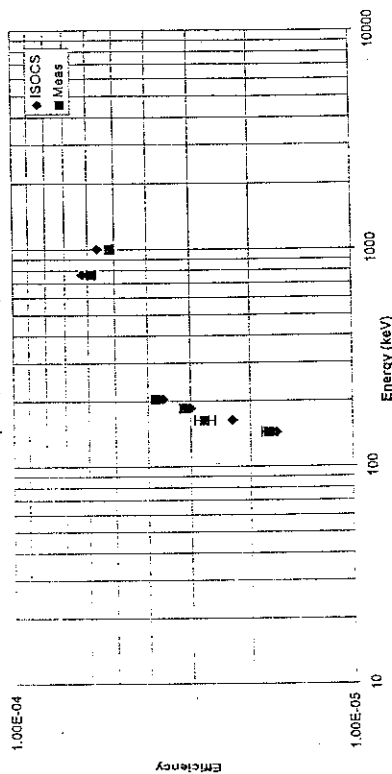
Units: Length: cm Density: g/cc

Source Material: U3_O8

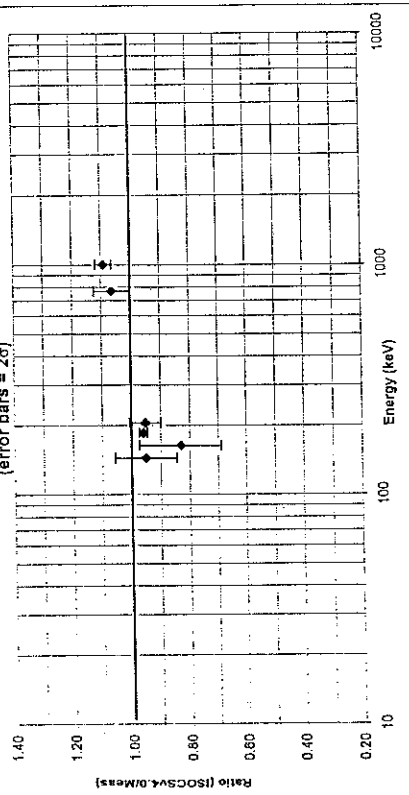
Comparison Results

Energy (keV)	ISOCs efficiency	Measured		Ratio (ISOCs/Meas)
		efficiency	1 σ unc	
143.79	1.68E-05	1.76E-05	9.28E-07	1.05E-01
163.38	2.27E-05	2.73E-05	1.93E-06	1.42E-01
185.74	3.01E-05	3.13E-05	2.08E-07	1.32E-02
205.33	3.61E-05	3.79E-05	1.02E-06	5.36E-02
766.41	6.23E-05	5.86E-05	1.78E-06	6.07E-02
1001	5.62E-05	5.15E-05	7.00E-07	2.72E-02
Wt. Rel. ISOCs				
		Dataset	Ratio	Std Dev
		<150 keV	0.98	0.056
		>150 keV	0.98	0.055
		All	0.98	0.055

Uranium Standard NBS-295 80 cm away
(error bars = 1 σ)



Uranium Standard NBS-295 80 cm away
(error bars = 2 σ)



URANIUM STANDARD NBS-295 30CM AWAY

Date: August 10, 2000

ISOCS Version: v4.0

This is a Certified Nuclear Reference Material. The certified U235/U and a height of 9 cm. The height of Uranium filling is 2.08 cm. mass % is 2.9492. The source is a cylinder with a diameter of 8 cm

ISQCS Geometry Parameters

Template: CIRCULAR PLANE

42% (S/N 3578). New Characterization

Collimator: NONE

Collimator: NONE	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.5	7				Al	2.7	
(2) Src - Lr 1	0.2					Al	2.7	0
(3) Src - Lr 2	2.08					Uoxide	2.4998	1
(4) Src - Lr 3	6.72					Al	2.7	
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	31.3	0	0	0	0			

Air Temp.: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

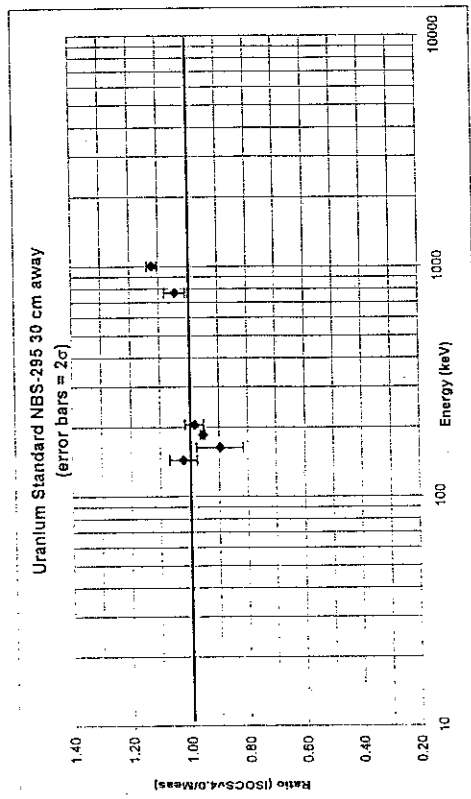
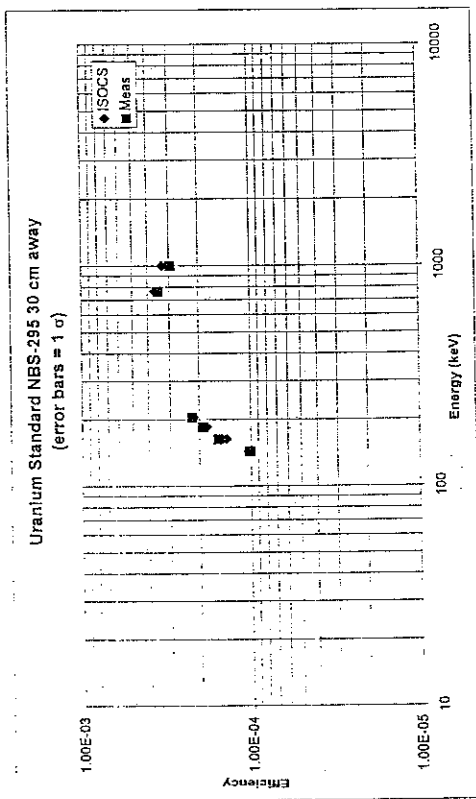
Convergence: 0.1%

Units: Length: cm Density: g/cc

Source Material: U3 08

Comparison Results

Comparison Results				Measured		Ratio	
Energy (keV)	ISOCS efficiency	efficiency	1 σ unc.	2 σ rel. unc.	(ISOCS/Meas)		
143.79	1.03E-04	1.01E-04	2.36E-06	4.68E-02	1.02		
163.38	1.39E-04	1.55E-04	6.24E-06	8.06E-02	0.90		
185.74	1.93E-04	1.91E-04	7.73E-07	8.10E-03	0.96		
205.33	2.18E-04	2.21E-04	3.48E-06	3.14E-02	0.98		
766.41	3.64E-04	3.48E-04	6.06E-06	3.48E-02	1.05		
1001	3.30E-04	2.94E-04	2.47E-06	1.68E-02	1.12		
						Wt. Mean	
		Dataset	Ratio	Std Dev	Std Dev		
		<150 keV					
		>150 keV	0.98	0.054	0.064		
		All	0.98	0.054	0.064		



URANIUM STANDARD NBS-446 80CM AWAY

Date: August 10, 2000

ISOCS Version: v4.0

This is a Certified Nuclear Reference Material. The certified U235/U mass % is 4.4623. The source is a cylinder with a diameter of 8 cm and a height of 9 cm. The height of Uranium filling is 1.58 cm.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.5	7				Al	2.7	0
(2) Src - Lr 1	0.2					Al	2.7	1
(3) Src - Lr 2	1.58					Uoxide	3.2908	1
(4) Src - Lr 3	7.22					Al	2.7	
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	80.7	0	0	0	0			

Alt: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

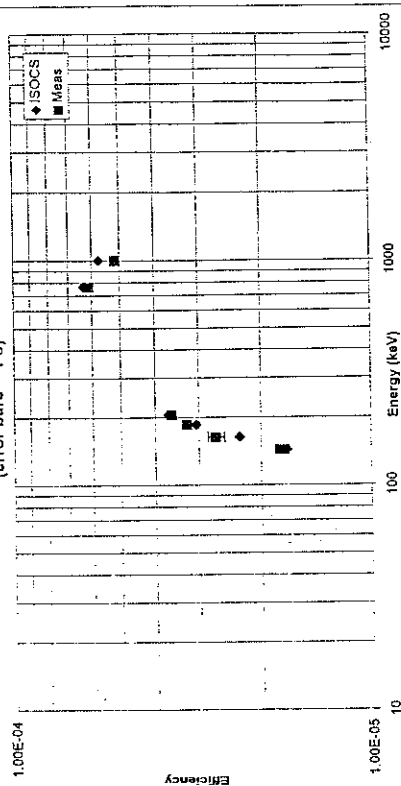
Units: Length: cm Density: g/cc

Source Material: U3_O8

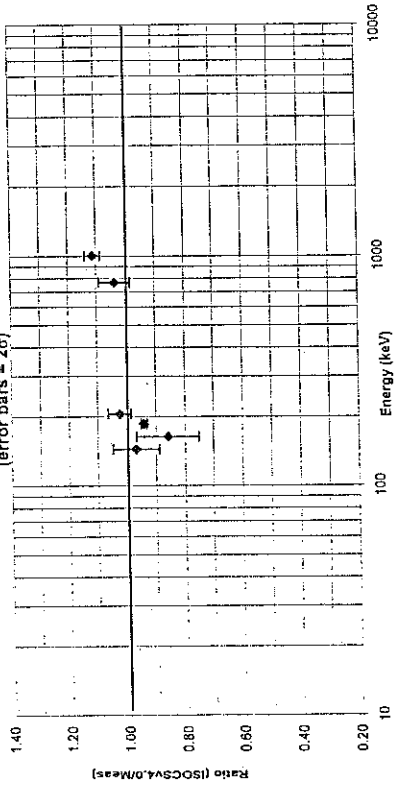
Comparison Results

Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)
143.79	1.70E-05	1.76E-05	7.00E-07	7.96E-02	0.97
163.36	2.31E-05	2.68E-05	1.45E-06	1.08E-01	0.86
185.74	3.05E-05	3.24E-05	1.72E-07	1.06E-02	0.94
205.33	3.67E-05	3.58E-05	7.12E-07	3.97E-02	1.02
756.41	6.36E-05	6.12E-05	1.66E-06	5.41E-02	1.04
1001	5.74E-05	5.15E-05	6.84E-07	2.66E-02	1.11
Dataset Ratio					Wt. Mean
<150 keV					0.96
>150 keV					0.96
All					0.961
					Std Dev
					0.060
					0.060

Uranium Standard NBS-446 80 cm away
(error bars = 1 σ)



Uranium Standard NBS-446 80 cm away
(error bars = 2 σ)



URANIUM STANDARD NBS-446 30CM AWAY

Date: August 10, 2000

ISOCS Version: v4.0

This is a Certified Nuclear Reference Material. The certified U235/U mass % is 4.4623. The source is a cylinder with a diameter of 8 cm and a height of 9 cm. The height of Uranium filling is 1.59 cm.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

42% (S/N 3578), New Characterization

Collimator: NONE

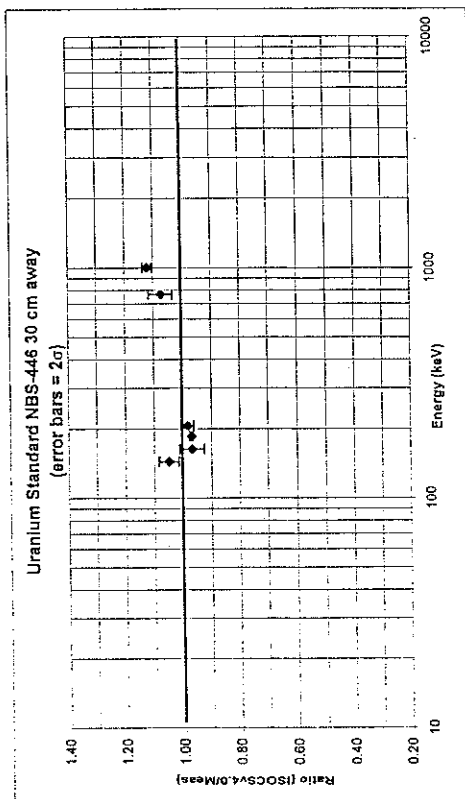
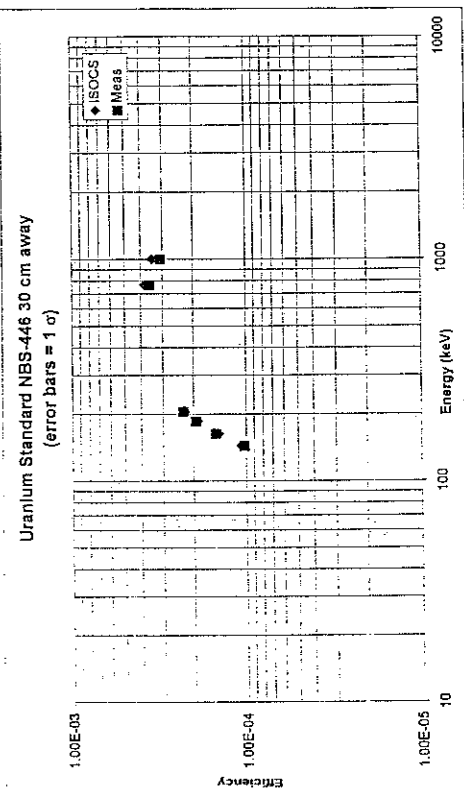
Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.5	7				Al	2.7	
(2) Src - Lr 1	0.2					Al	2.7	0
(3) Src - Lr 2	1.58					Uoxide	3.2908	1
(4) Src - Lr3	7.22					Al	2.7	
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	30.7	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

Source Material: U3_O8



Comparison Results

Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc.	2 σ rel. unc.	Ratio (ISOCS/Meas)
143.79	1.07E-04	1.02E-04	1.76E-06	3.44E-02	1.05
163.38	1.45E-04	1.49E-04	3.24E-06	4.35E-02	0.97
185.74	1.90E-04	1.95E-04	5.77E-07	5.90E-03	0.97
205.33	2.27E-04	2.30E-04	2.66E-06	2.31E-02	0.98
766.41	3.82E-04	3.55E-04	7.31E-06	4.12E-02	1.07
1001	3.46E-04	3.08E-04	2.46E-06	1.59E-02	1.12
Wt. Mean					
Ratio					
Dataset					
<150 keV					
>150 keV					
All					
Std Dev					
0.99					
0.048					
0.048					

1 LITER MARINELLI BEAKER (1 g/cc)

ISOCs Version: 3.0

Date: May 11, 1999

This is a 1 liter Marinelli beaker with 1 g/cc active matrix resting on the endcap of the detector.

The source data comes from MCNP.

ISOCs Geometry Parameters

Template: MARINELLIWELL

Detector: 60% (S/N 3222)

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Liner Side	0.127	9.966	10.16			Polyprop	0.9	
(2) Liner End	0.127					Polyprop	0.9	
(3) Src - Side	1.888					Water	1	1
(4) Src - End	1.893					Water	1	1
(5) Src-Det	0	0						

Air: Temp: 0 C Rel. Hum.: 0% Bar. Press.: 0 mm Hg

Convergence: 0.1%

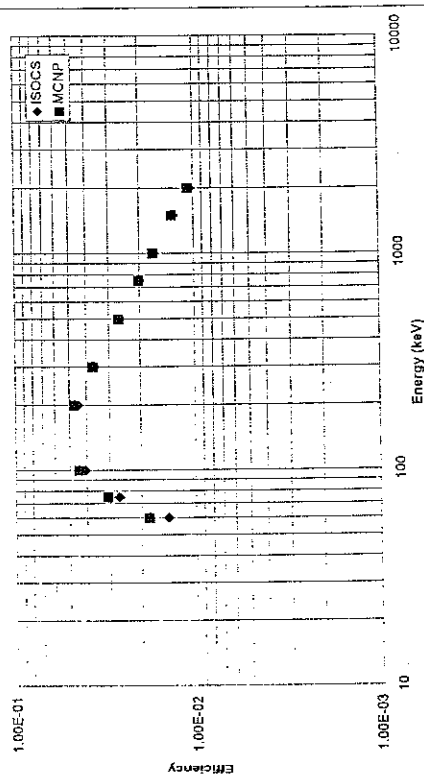
Units: Length: cm Density: g/cc

Comparison Results

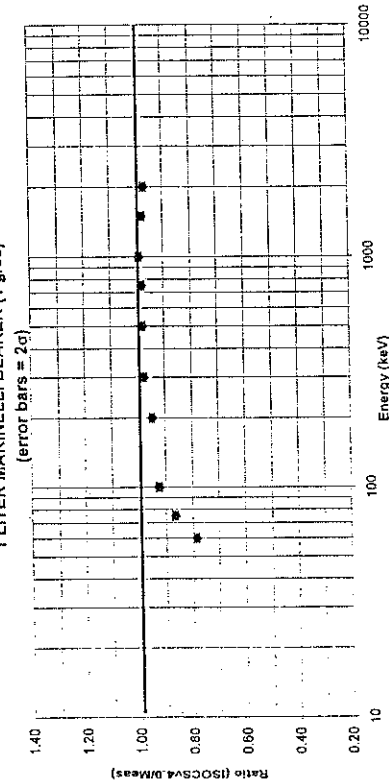
Energy (keV)	ISOCs efficiency	Measured efficiency	1 σ unc.	2 σ rel. unc.	Ratio (ISOCs/Meas)
60	1.43E-02	1.81E-02	9.06E-05	1.00E-02	0.79
75	2.68E-02	3.09E-02	1.54E-04	1.00E-02	0.87
100	4.11E-02	4.44E-02	2.22E-04	1.00E-02	0.92
200	4.45E-02	4.69E-02	2.35E-04	1.00E-02	0.95
300	3.62E-02	3.69E-02	1.85E-04	1.00E-02	0.98
500	2.60E-02	2.65E-02	1.32E-04	1.00E-02	0.98
750	2.00E-02	2.04E-02	1.02E-04	1.00E-02	0.98
1000	1.67E-02	1.69E-02	8.45E-05	1.00E-02	0.99
1500	1.30E-02	1.32E-02	6.61E-05	1.00E-02	0.98
2000	1.05E-02	1.08E-02	5.39E-05	1.00E-02	0.97

Dataset	Mean Ratio	Relative Std Dev	ISOCs Std Dev
<150 keV	0.85	0.081	0.081
>150 keV	0.98	0.014	0.013
All	0.93	0.078	0.078

1 LITER MARINELLI BEAKER (1 g/cc)



1 LITER MARINELLI BEAKER (1 g/cc)



1 LITER MARINELLI BEAKER (1.15 g/cc) ON A 42% DETECTOR

Date: August 10, 2000 ISOCS Version: v4.0

This is a 1 liter Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix S/N 96-20 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker		Container dimensions from the file 138g.BKR						
(2) Top layer	0.4					Epoxy	1.15	1
(3) Bottom layer	9.818					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

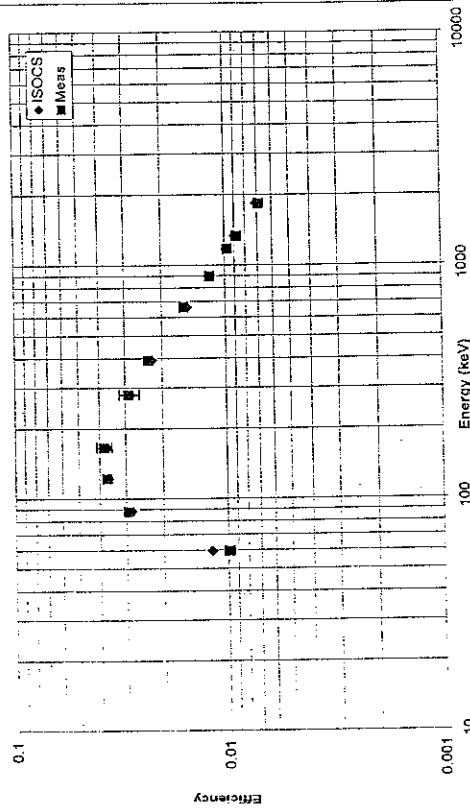
Units: Length: cm Density: g/cc

Source Material: 14.7%Ca+11.8%S+34.5%O+3%K+36%K

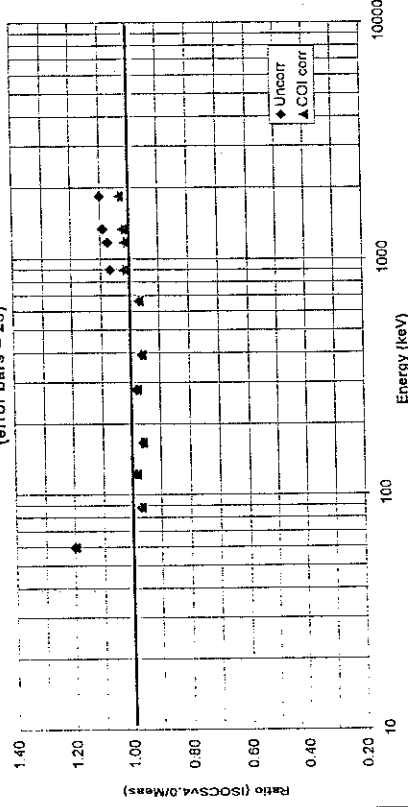
Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff * COI	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)	Corrected
59.64	1.19E-02	1	1.19E-02	9.93E-03	5.21E-04	1.05E-01	1.20	1.20
88	2.84E-02	1	2.84E-02	2.93E-02	1.41E-03	9.62E-02	0.97	0.97
122	3.65E-02	1	3.65E-02	3.70E-02	1.78E-03	9.51E-02	0.99	0.99
165.9	3.68E-02	1	3.68E-02	3.81E-02	3.10E-03	1.63E-01	0.96	0.96
279	2.83E-02	1	2.83E-02	2.89E-02	3.10E-03	2.15E-01	0.98	0.98
392	2.24E-02	1	2.24E-02	2.33E-02	1.09E-03	9.36E-02	0.96	0.96
662	1.52E-02	1	1.52E-02	1.57E-02	7.20E-04	9.17E-02	0.97	0.97
898	1.26E-02	0.952	1.20E-02	1.18E-02	5.18E-04	8.78E-02	1.07	1.02
1173	1.05E-02	0.941	9.86E-03	9.73E-03	3.97E-04	8.16E-02	1.08	1.01
1332	9.63E-03	0.935	9.01E-03	8.82E-03	4.21E-04	9.55E-02	1.09	1.02
1836	7.60E-03	0.938	7.13E-03	6.90E-03	3.29E-04	9.54E-02	1.10	1.03
Wt. Mean								
				Dataset	Ratio	Wt. Rel.	ISOCS	
				<150 keV	1.03	Std Dev	Std Dev	
				>150 keV	1.00	0.11	0.10	
				All	1.01	0.03	0.03	
						0.06	0.03	

1 LITER MARINELLI BEAKER (1.60 g/cc)

(error bars = 1 σ)

1 LITER MARINELLI BEAKER (1.60 g/cc)

(error bars = 2 σ)

1 LITER MARINELLI BEAKER (1.6 g/cc) ON A 42% DETECTOR

Date: August 10, 2000

ISOCS Version: v4.0

This is a 1 liter Marinelli beaker with 1.6 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix SN 96-21 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker			Container dimensions from the file 139g.BKR					
(2) Top layer	0.5					HDPEpoxy	1.6	1
(3) Bottom layer	9.818					HDPEpoxy	1.6	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

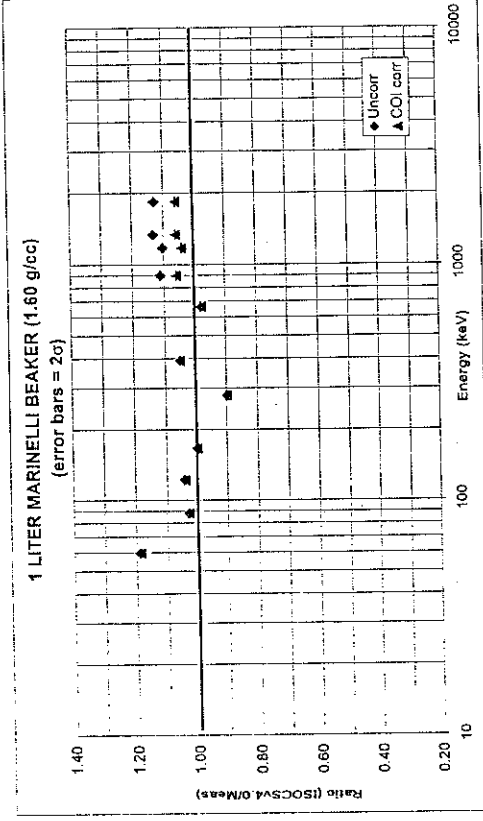
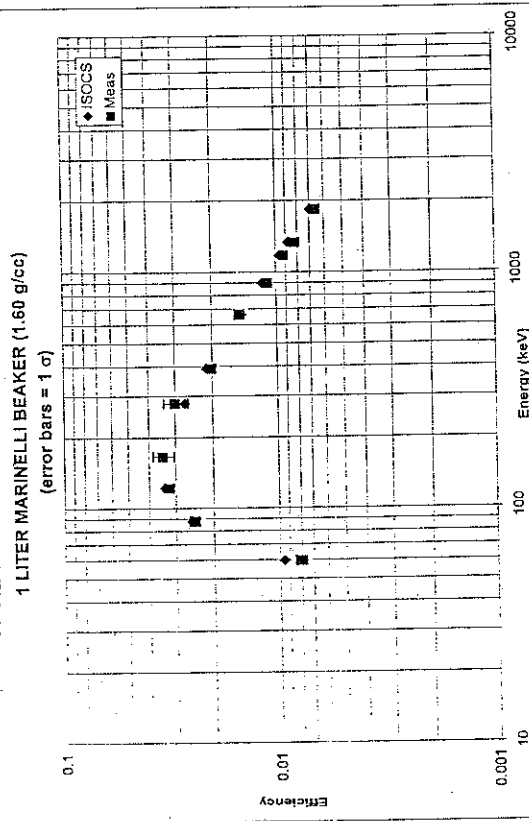
Convergence: 0.1%

Units: Length: cm Density: g/cc

Source Material: 14.7%Ca+11.8%S+34.5%O+3%H+36%C

Comparison Results

Energy (keV)	ISOCS efficiency	ISOCS COI factor	ISOCS eff * COI	Measured efficiency	1 σ unc.	2 σ rel. unc.	Ratio (ISOCS/Meas)	Corrected Ratio
59.64	9.56E-03	1	9.56E-03	8.04E-03	4.75E-04	1.18E-01	1.19	1.19
88	2.54E-02	1	2.54E-02	2.47E-02	1.23E-03	9.96E-02	1.03	1.03
122	3.37E-02	1	3.37E-02	3.24E-02	1.65E-03	1.02E-01	1.04	1.04
165.9	3.43E-02	1	3.43E-02	3.44E-02	3.88E-03	2.26E-01	1.00	1.00
279	2.69E-02	1	2.69E-02	3.00E-02	3.88E-03	2.59E-01	0.90	0.90
392	2.14E-02	1	2.14E-02	2.04E-02	1.03E-03	1.01E-01	1.05	1.05
662	1.47E-02	1	1.47E-02	1.50E-02	7.05E-04	9.40E-02	0.98	0.98
898	1.22E-02	0.952	1.16E-02	1.10E-02	4.99E-04	9.07E-02	1.11	1.06
1173	1.02E-02	0.941	9.60E-03	9.24E-03	3.85E-04	8.33E-02	1.10	1.04
1332	9.40E-03	0.935	8.79E-03	8.29E-03	4.01E-04	9.67E-02	1.13	1.06
1836	7.46E-03	0.938	6.99E-03	6.60E-03	3.26E-04	9.88E-02	1.13	1.06
				Wt. Mean		Ratio	Std Dev	ISOCS Std Dev
				Dataset		<150 keV	1.07	0.05
						>150 keV	1.03	0.04
				All		1.04	0.05	0.05



400 ML M.BEAKER (1.15 g/cc) ON A 42% DETECTOR

Date: August 10, 2000 ISOCS Version: v4.0

This is a 400 mL Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix S/N 96-22 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

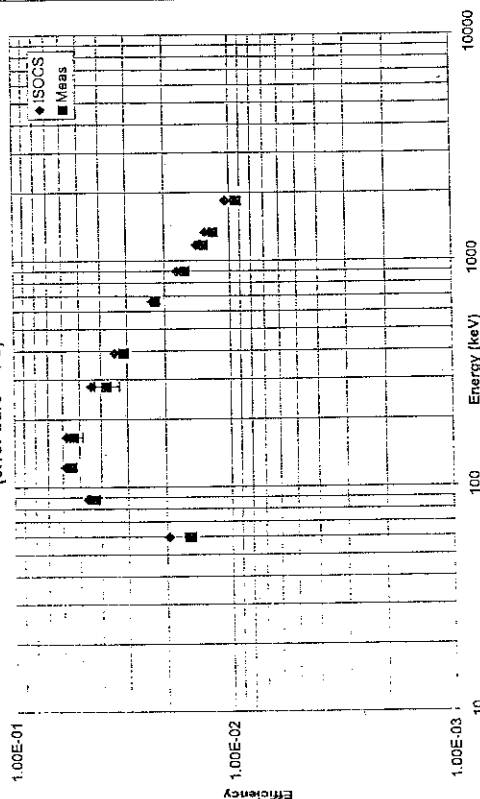
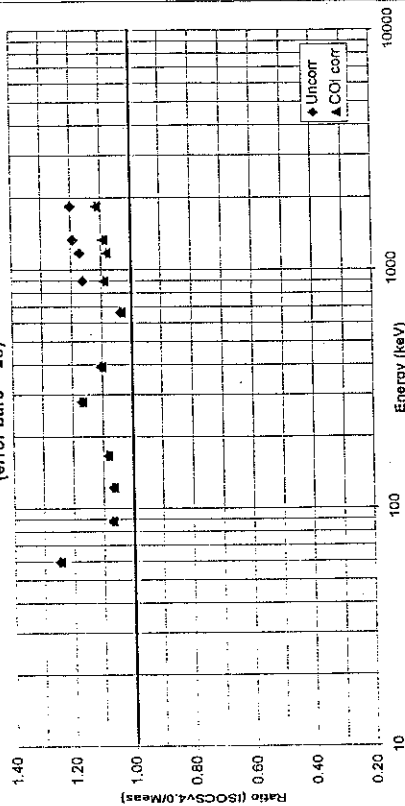
Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker								
(2) Top layer	0.8					Epoxy	1.15	1
(3) Bottom layer	7.318					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

Source Material: 72.1%Co+21.9%O+6%H

400 ML MARINELLI BEAKER (1.15 g/cc)
(error bars = 1 σ)400 ML MARINELLI BEAKER (1.15 g/cc)
(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff * COI	efficiency 1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)	Corrected
59.64	1.96E-02	1	1.96E-02	1.57E-02	8.71E-04	1.11E-01	1.25
88	4.60E-02	1	4.60E-02	4.30E-02	2.11E-03	9.31E-02	1.07
122	5.83E-02	1	5.83E-02	5.47E-02	2.72E-03	9.95E-02	1.07
165.9	5.78E-02	1	5.78E-02	5.33E-02	5.01E-03	1.88E-01	1.08
279	4.40E-02	1	4.40E-02	3.78E-02	5.01E-03	2.66E-01	1.17
392	3.45E-02	1	3.45E-02	3.12E-02	1.56E-03	1.00E-01	1.10
662	2.30E-02	1	2.30E-02	2.22E-02	1.04E-03	9.37E-02	1.03
898	1.87E-02	0.938	1.76E-02	1.61E-02	7.43E-04	9.23E-02	1.09
1173	1.55E-02	0.922	1.43E-02	1.32E-02	5.53E-04	8.38E-02	1.17
1332	1.42E-02	0.916	1.30E-02	1.19E-02	5.78E-04	9.71E-02	1.19
1836	1.12E-02	0.929	1.04E-02	9.36E-03	4.68E-04	1.00E-01	1.12
Wt. Mean							ISOCS
Dataset Ratio							Std Dev
<150 keV							0.07
>150 keV							0.03
All							0.05

400 ML M.BEAKER (1.6 g/cc) ON A 42% DETECTOR

Date: August 10, 2000 ISOCS Version: v4.0

This is a 400 mL Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix S/N 96-23 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker	1	Container dimensions from the file 590g.BKR					HDEpoxy	1.6
(2) Top layer	7.318					HDEpoxy	1.6	1
(3) Bottom layer						HDEpoxy	1.6	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

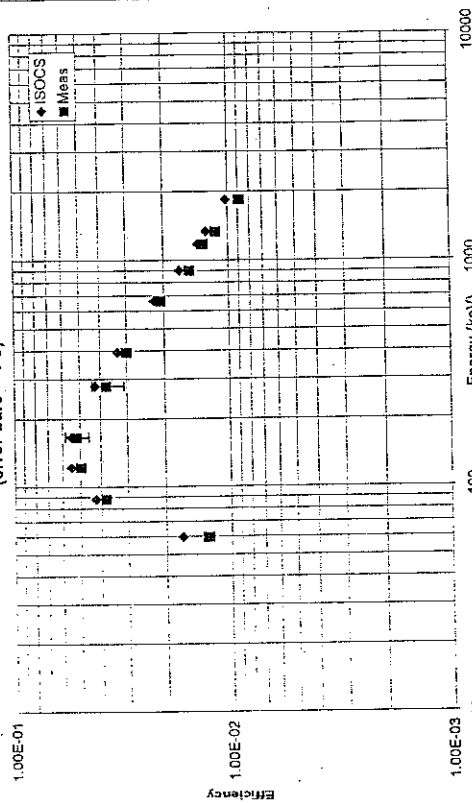
Units: Length: cm Density: g/cc

Source Material: 14.7%Ca+11.8%S+34.5%O+3%⁶⁰Co

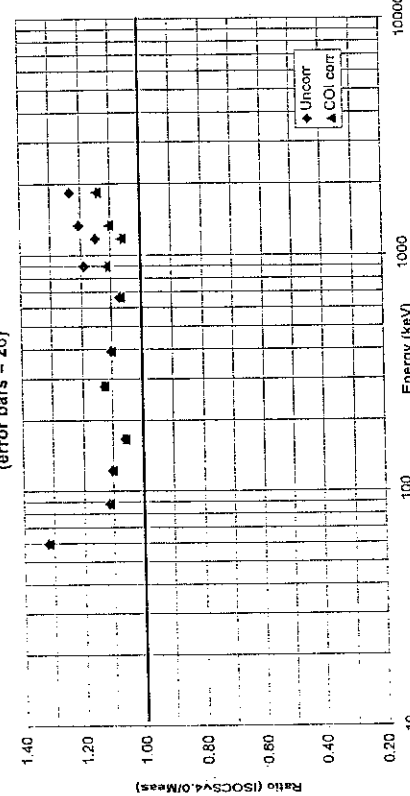
Comparison Results

Energy (keV)	ISOCS efficiency	ISOCS COI factor	ISOCS eff * COI	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)	Corrected
59.64	1.70E-02	1	1.70E-02	1.29E-02	7.42E-04	1.15E-01	1.32	1.32
88	4.28E-02	1	4.28E-02	3.81E-02	1.90E-03	9.97E-02	1.12	1.12
122	5.50E-02	1	5.50E-02	4.98E-02	2.47E-03	9.92E-02	1.10	1.10
165.9	5.49E-02	1	5.49E-02	5.18E-02	6.34E-03	2.45E-01	1.06	1.06
279	4.23E-02	1	4.23E-02	3.74E-02	6.34E-03	3.39E-01	1.13	1.13
392	3.32E-02	1	3.32E-02	3.01E-02	1.50E-03	9.97E-02	1.10	1.10
662	2.23E-02	1	2.23E-02	2.08E-02	9.72E-04	9.35E-02	1.07	1.07
898	1.82E-02	0.937	1.71E-02	1.53E-02	7.07E-04	9.24E-02	1.19	1.12
1173	1.51E-02	0.923	1.39E-02	1.31E-02	5.47E-04	8.35E-02	1.15	1.06
1332	1.39E-02	0.916	1.27E-02	1.15E-02	5.61E-04	9.76E-02	1.21	1.11
1836	1.10E-02	0.929	1.02E-02	8.92E-03	4.47E-04	1.00E-01	1.24	1.15
Wt. Rel.								
				Dataset	Ratio	Std Dev	ISOCS	
				<150 keV	1.15	0.09	Std Dev	0.07
				>150 keV	1.10	0.03		0.03
				All	1.11	0.05		0.01

400 ML MARINELLI BEAKER (1.60 g/cc)

(error bars = 1 σ)

400 ML MARINELLI BEAKER (1.60 g/cc)

(error bars = 2 σ)

1 LITER MARINELLI BEAKER (1.15 g/cc) ON A 20% DETECTOR

Date: August 10, 2000

ISOCS Version: v4.0

This is a 1 liter Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix S/N 96-20 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: Markku's 20%, New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker			Container dimensions from the file 138g.BKR					
(2) Top layer	0.4					Epoxy	1.15	1
(3) Bottom layer	9.818					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

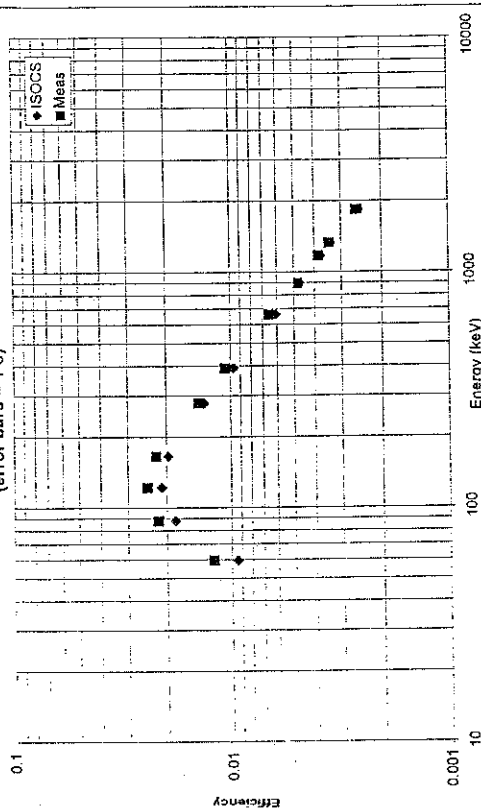
Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

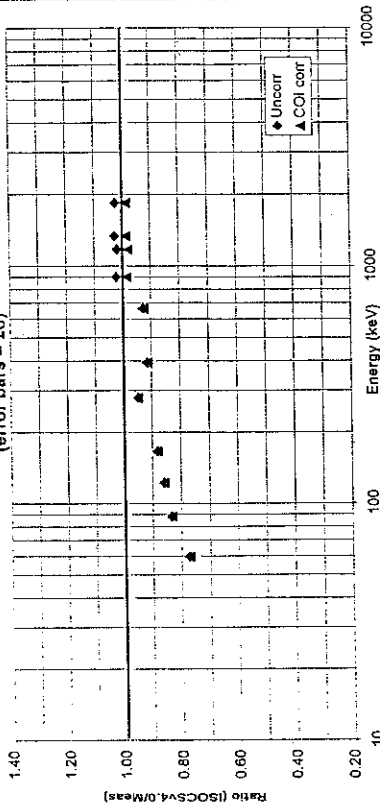
Units: Length: cm Density: g/cc

Source Material: 72.1%C+21.9%O+6%H

1 LITER MARINELLI BEAKER (1.15 g/cc)

(error bars = 1 σ)

1 LITER MARINELLI BEAKER (1.15 g/cc)

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCS efficiency	Conc. correction	ISOCS eff * COI	efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)	Ratio	Corr. ratio
59.64	9.44E-03	1	9.44E-03	1.22E-02	6.20E-04	1.02E-01	0.77	0.77	0.77
88	1.83E-02	1	1.83E-02	2.19E-02	1.03E-03	9.41E-02	0.83	0.83	0.83
122	2.11E-02	1	2.11E-02	2.46E-02	1.14E-03	9.27E-02	0.86	0.86	0.86
165.9	1.97E-02	1	1.97E-02	2.23E-02	9.08E-04	8.14E-02	0.88	0.88	0.88
279	1.34E-02	1	1.34E-02	1.41E-02	6.42E-04	9.11E-02	0.95	0.95	0.95
392	9.68E-03	1	9.68E-03	1.06E-02	4.73E-04	8.92E-02	0.91	0.91	0.91
652	6.07E-03	1	6.07E-03	6.56E-03	2.99E-04	9.12E-02	0.93	0.93	0.93
898	4.89E-03	0.963	4.71E-03	4.79E-03	2.94E-04	8.52E-02	1.02	1.02	0.98
1173	3.89E-03	0.961	3.74E-03	3.83E-03	1.55E-04	8.09E-02	1.02	1.02	0.98
1332	3.51E-03	0.96	3.37E-03	3.42E-03	1.52E-04	9.47E-02	1.03	1.03	0.98
1836	2.84E-03	0.962	2.54E-03	2.58E-03	1.20E-04	9.30E-02	1.02	1.02	0.98
				Dataset	Wt. Mean	Wt. Rel.	Std Dev	Std Dev	Std Dev
				<150 keV	0.82	0.05	0.05	0.02	0.02
				>150 keV	0.95	0.04	0.04	0.04	0.04
				All	0.91	0.08	0.08	0.06	0.06

1 LITER MARINELLI BEAKER (1.6 g/cc) ON A 20% DETECTOR

Date: August 10, 2000

ISOCS Version: v4.0

This is a 1 liter Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix SN 96-21 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: Markku's 20%, New characterization

Collimator: NONE

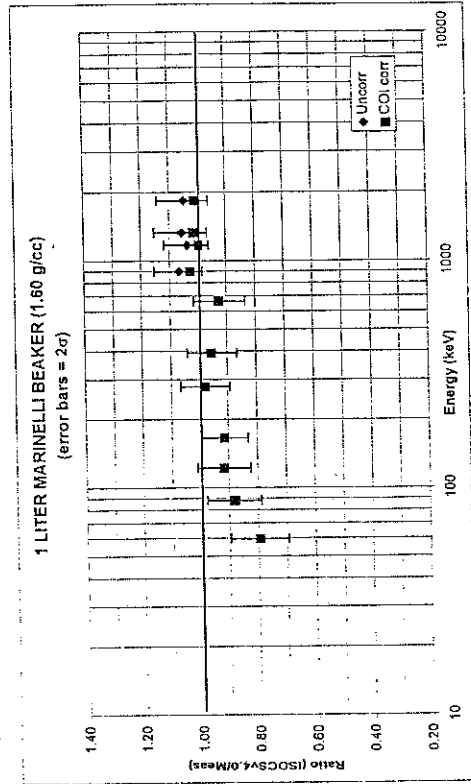
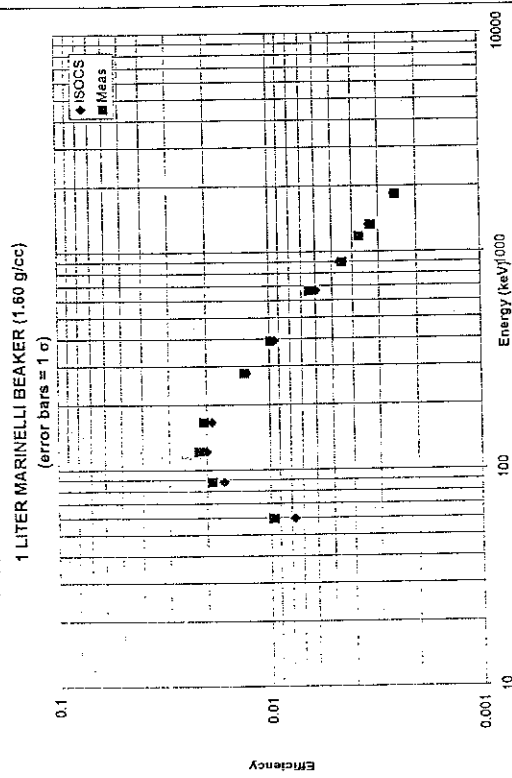
Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker			Container dimensions from the file 139g.BKR					
(2) Top layer	0.5					HDEpoxy	1.6	1
(3) Bottom layer	9.818					HDEpoxy	1.6	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

Source Material: 72.1%C+21.9%O+6%H



Comparison Results

Energy (keV)	ISOCS efficiency	COI efficiency	ISOCS eff * COI	COI efficiency	Measured 1 σ unc	Measured 2 σ rel. unc	Ratio (ISOCS/Meas)	Ratio	Corr. ratio
59.84	7.74E-03	1	7.74E-03	9.73E-03	4.93E-04	1.01E-01	0.80	0.80	0.80
88	1.67E-02	1	1.67E-02	1.89E-02	8.92E-04	9.44E-02	0.88	0.88	0.88
122	2.00E-02	1	2.00E-02	2.18E-02	1.02E-03	9.38E-02	0.92	0.92	0.92
165.9	1.88E-02	1	1.88E-02	2.05E-02	8.40E-04	8.16E-02	0.91	0.91	0.91
279	1.29E-02	1	1.29E-02	1.32E-02	5.80E-04	8.79E-02	0.98	0.98	0.98
392	9.45E-03	1	9.45E-03	9.89E-03	4.40E-04	8.90E-02	0.96	0.96	0.96
662	5.97E-03	1	5.97E-03	6.43E-03	2.93E-04	9.11E-02	0.93	0.93	0.93
898	4.82E-03	0.963	4.64E-03	4.51E-03	1.91E-04	8.47E-02	1.07	1.04	1.03
1173	3.86E-03	0.96	3.70E-03	3.71E-03	1.50E-04	8.09E-02	1.00	1.00	1.00
1332	3.48E-03	0.96	3.34E-03	3.28E-03	1.56E-04	9.51E-02	1.06	1.06	1.02
1836	2.63E-03	0.963	2.53E-03	2.50E-03	1.16E-04	9.29E-02	1.05	1.05	1.01
Wt. Mean							Ratio	Std Dev	ISOCS
Dataset							Ratio	Std Dev	Std Dev
<150 keV							0.86	0.07	0.06
>150 keV							0.98	0.05	0.01
All							0.94	0.08	0.06

400 ML M.BEAKER (1.15 g/cc) ON A 20% DETECTOR

Date: August 10, 2000 ISOCS Version: v4.0

This is a 400 ml. Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix S/N 96-22 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: Markku's 20%, New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Cont.
(1) Beaker	0.8	Container dimensions from the file 590g.BKR					1.15	1
(2) Top layer	7.318					Epoxy	1.15	1
(3) Bottom layer						Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

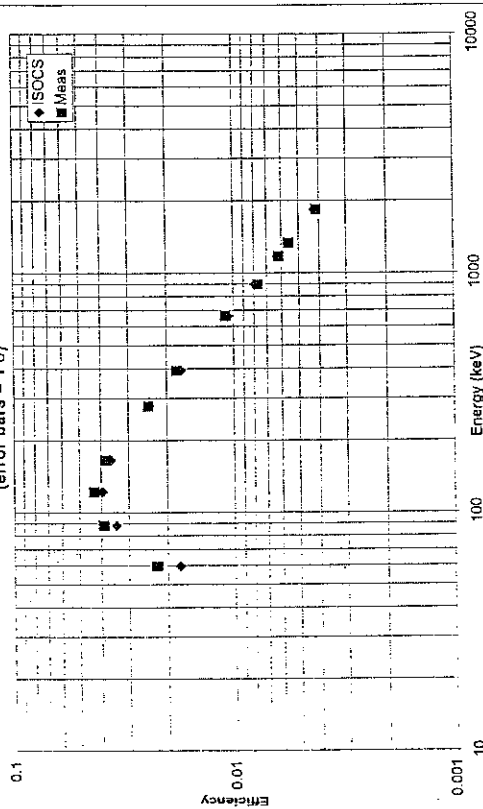
Units: Length: cm Density: g/cc

Source Material: 72.1%C+21.9%O+6%H

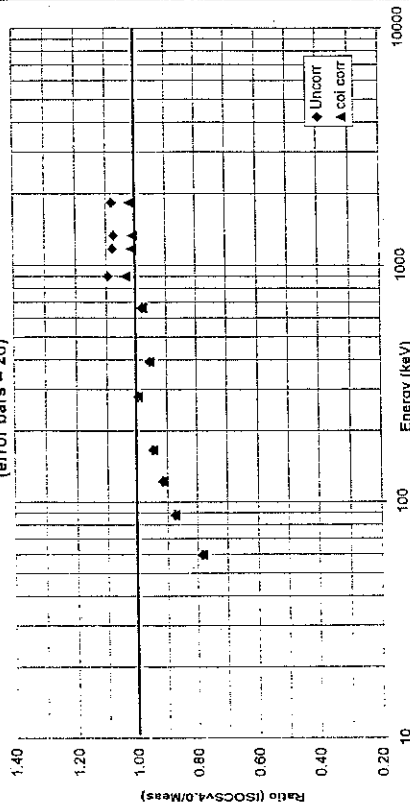
Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff * COI	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)	Corrected
59.64	1.77E-02	1	1.77E-02	2.26E-02	1.14E-03	1.01E-01	0.79	0.79
88	3.43E-02	1	3.43E-02	3.92E-02	1.85E-03	9.44E-02	0.88	0.88
122	3.96E-02	1	3.96E-02	4.32E-02	2.00E-03	9.26E-02	0.92	0.92
165.9	3.63E-02	1	3.63E-02	3.83E-02	1.55E-03	8.09E-02	0.95	0.95
279	2.43E-02	1	2.43E-02	2.44E-02	1.09E-03	8.93E-02	0.99	0.99
392	1.74E-02	1	1.74E-02	1.82E-02	8.12E-04	8.92E-02	0.96	0.96
662	1.07E-02	1	1.07E-02	1.09E-02	4.99E-04	9.16E-02	0.98	0.98
898	8.47E-03	0.943	7.99E-03	7.73E-03	3.29E-04	8.51E-02	1.10	1.03
1173	6.67E-03	0.94	6.27E-03	6.19E-03	2.51E-04	8.11E-02	1.08	1.01
1332	5.98E-03	0.94	5.62E-03	5.57E-03	2.66E-04	9.55E-02	1.07	1.01
1836	4.48E-03	0.943	4.22E-03	4.14E-03	1.93E-04	9.32E-02	1.08	1.02
Wt. Mean								
				Dataset	Ratio	Wt. Rel.	ISOCS	
				<150 keV	0.86	0.08	Std Dev	0.02
				>150 keV	0.99	0.03	Std Dev	0.03
				All	0.95	0.08	Std Dev	0.07

400 ML MARINELLI BEAKER (1.15 g/cc)

(error bars = 1 σ)

400 ML MARINELLI BEAKER (1.15 g/cc)

(error bars = 2 σ)

400 ML M.BEAKER (1.6 g/cc) ON A 20% DETECTOR

Date: August 10, 2000

ISOCS Version: v4.0

This is a 400 mL Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix S/N 96-23 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: Markku's 20%, New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker	1					HDEPOXY	1.6	1
(2) Top layer	7.318					HDEPOXY	1.6	1
(3) Bottom layer								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

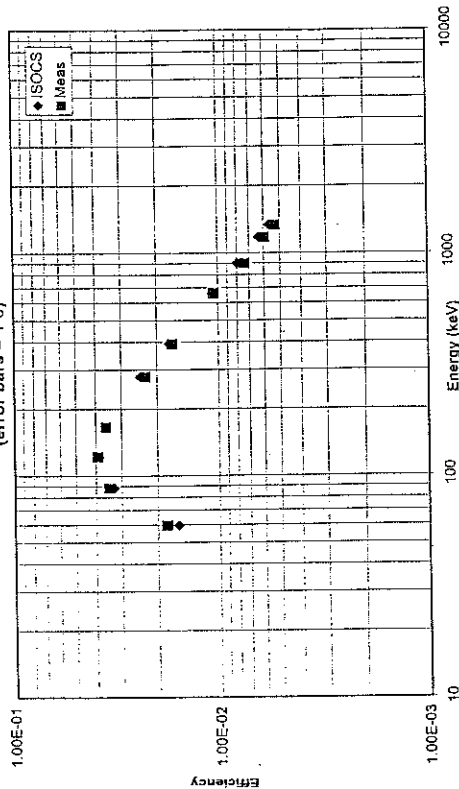
Source Material: 72.1%⁶⁰Co+21.9%¹³⁷Cs+6%¹³²I

Comparison Results

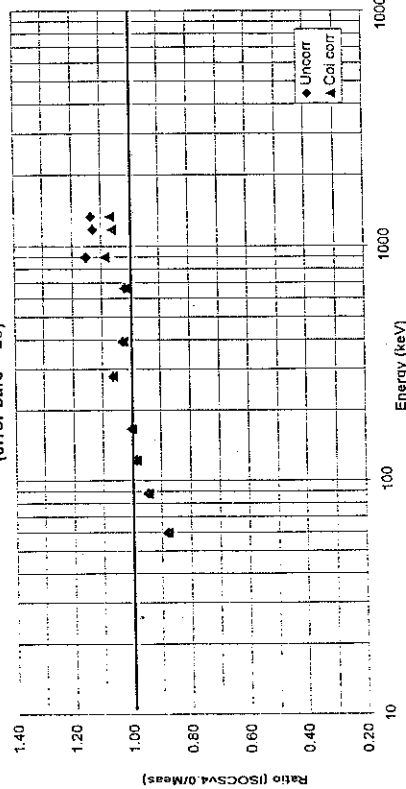
Energy (keV)	ISOCS efficiency	ISOCS COI factor	ISOCS eff * COI	efficiency	1 σ unc	2 σ rel. unc	Measured	Ratio (ISOCS/Meas)	Corrected
59.64	1.60E-02	1	1.60E-02	1.82E-02	9.17E-04	1.01E-01	1.01E-01	0.88	0.88
88	3.29E-02	1	3.29E-02	3.47E-02	1.64E-03	9.45E-02	9.45E-02	0.95	0.95
122	3.87E-02	1	3.87E-02	3.93E-02	1.82E-03	9.26E-02	9.26E-02	0.98	0.98
165.9	3.58E-02	1	3.58E-02	3.58E-02	1.45E-03	8.10E-02	8.10E-02	1.00	1.00
279	2.41E-02	1	2.41E-02	2.27E-02	1.01E-03	8.90E-02	8.90E-02	1.06	1.06
392	1.74E-02	1	1.74E-02	1.69E-02	7.52E-04	8.90E-02	8.90E-02	1.03	1.03
662	1.07E-02	1	1.07E-02	1.05E-02	4.78E-04	9.10E-02	9.10E-02	1.02	1.02
898	8.49E-03	0.943	8.01E-03	7.36E-03	3.13E-04	8.51E-02	8.51E-02	1.15	1.09
1173	6.72E-03	0.94	6.32E-03	5.95E-03	2.40E-04	8.07E-02	8.07E-02	1.13	1.06
1332	6.02E-03	0.94	5.66E-03	5.30E-03	2.53E-04	9.55E-02	9.55E-02	1.14	1.07

Dataset	Wt. Mean Ratio	Wt. Rel. Std Dev	ISOCS Std Dev
<150 keV	0.94	0.06	0.01
>150 keV	1.01	0.04	0.04
All	1.01	0.06	0.04

400 ML MARINELLI BEAKER (1.6 g/cc)

(error bars = 1 σ)

400 ML MARINELLI BEAKER (1.60 g/cc)

(error bars = 2 σ)

1 LITER MARINELLI BEAKER (1.15 g/cc) ON A 60% DETECTOR

Date: August 10, 2000

ISOCS Version: v4.0

This is a 1 liter Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix S/N 96-20 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: Markku's 60%, New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker								
(2) Top layer	0.4	Container dimensions from the file 138g.BKR				Epoxy	1.15	1
(3) Bottom layer	9.818					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

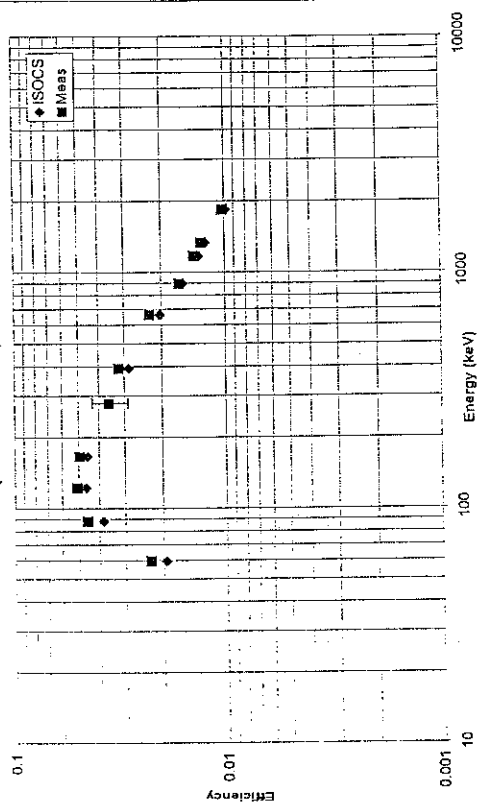
Units: Length: cm Density: g/cc

Source Material: 72.1%C+21.9%O+6%H

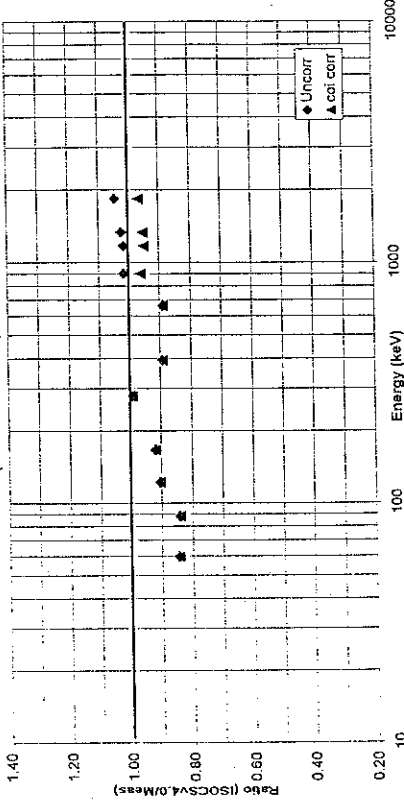
Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff * COI	Measured efficiency	1 σ unc.	2 σ rel. unc.	Ratio (ISOCS/Meas)	Corrected Ratio
59.64	1.94E-02	1	1.94E-02	2.30E-02	1.18E-03	1.03E-01	0.85	0.85
88	3.85E-02	1	3.85E-02	4.57E-02	2.18E-03	9.54E-02	0.84	0.84
122	4.63E-02	1	4.63E-02	5.12E-02	2.56E-03	1.00E-01	0.90	0.90
165.9	4.55E-02	1	4.55E-02	4.95E-02	2.15E-03	8.69E-02	0.92	0.92
279	3.57E-02	1	3.57E-02	3.60E-02	7.05E-03	3.92E-01	0.99	0.99
392	2.87E-02	1	2.87E-02	3.21E-02	1.55E-03	9.72E-02	0.89	0.89
662	2.03E-02	1	2.03E-02	2.28E-02	1.04E-03	9.12E-02	0.89	0.89
898	1.68E-02	0.944	1.58E-02	1.65E-02	7.17E-04	8.69E-02	1.02	0.96
1173	1.42E-02	0.934	1.33E-02	1.40E-02	5.68E-04	8.11E-02	1.02	0.95
1332	1.32E-02	0.93	1.23E-02	1.29E-02	6.17E-04	9.57E-02	1.02	0.95
1836	1.06E-02	0.925	9.85E-03	1.02E-02	4.85E-04	9.51E-02	1.04	0.97
ISOCS								
				Dataset	Ratio	Wt. Rel.	Std Dev	Std Dev
				<150 keV	0.86	0.04	0.04	0.04
				>150 keV	0.93	0.03	0.03	0.03
				All	0.91	0.05	0.05	0.01

1 LITER MARINELLI BEAKER (1.15 g/cc)

(error bars = 1 σ)

1 LITER MARINELLI BEAKER (1.15 g/cc)

(error bars = 2 σ)

1 LITER MARINELLI BEAKER (1.6 g/cc) ON A 60% DETECTOR

Date: August 10, 2000

ISOCSS Version: v4.0

This is a 1 liter Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix S/N 96-21 mixed gamma source.

ISOCSS Geometry Parameters

Template: BEAKER

Detector: Markku's 60%, New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker						Container dimensions from the file 138g.BKR		
(2) Top layer	0.5					HDEpoxy	1.6	1
(3) Bottom layer	9.818					HDEpoxy	1.6	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

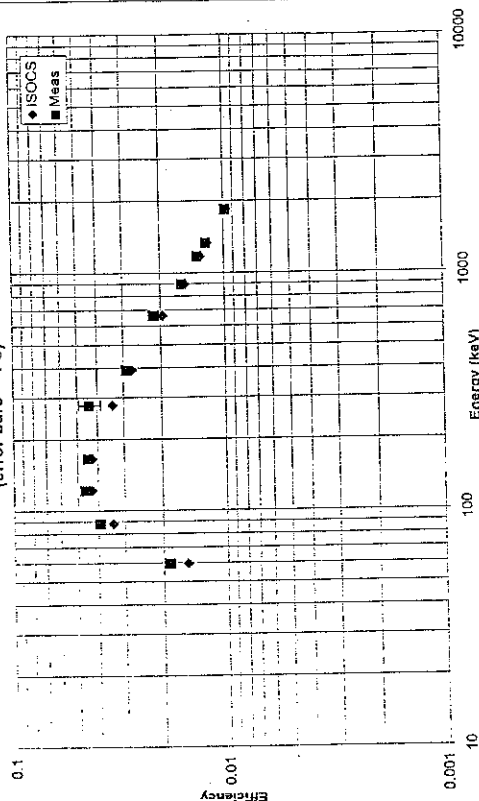
Air: Temp: 20 C Rel Hum: 50% Bar Press.: 760 mm Hg

Convergence: 0.1%

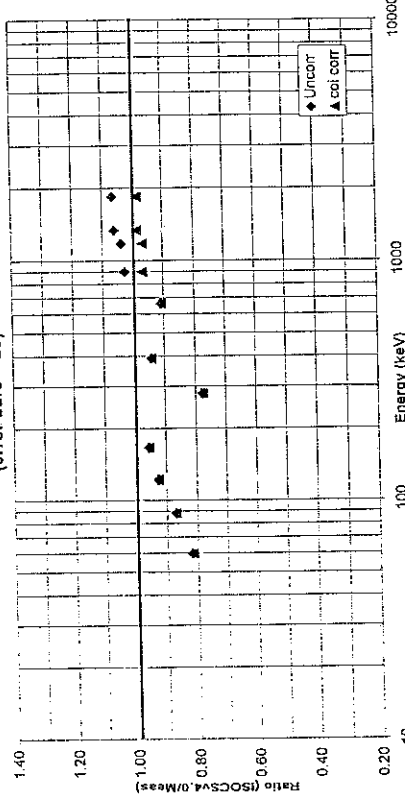
Units: Length: cm Density: g/cc

Source Material: 72.1%⁶⁰Co+21.9%¹³⁷Cs+6%¹³²I

1 LITER MARINELLI BEAKER (1.60 g/cc)

(error bars = 1 σ)

1 LITER MARINELLI BEAKER (1.60 g/cc)

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCSS efficiency	COI factor	ISOCSS eff * COI	efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCSS/Meas)	Corrected
59.64	1.55E-02	1	1.55E-02	1.89E-02	9.86E-04	1.04E-01	0.82	0.82
88	3.44E-02	1	3.44E-02	3.95E-02	1.89E-03	9.57E-02	0.87	0.87
122	4.28E-02	1	4.28E-02	4.82E-02	2.26E-03	9.78E-02	0.93	0.93
165.9	4.27E-02	1	4.27E-02	4.46E-02	1.95E-03	8.74E-02	0.96	0.96
279	3.40E-02	1	3.40E-02	4.37E-02	5.28E-03	2.42E-01	0.78	0.78
392	2.75E-02	1	2.75E-02	2.91E-02	1.38E-03	9.48E-02	0.94	0.94
662	1.96E-02	1	1.96E-02	2.16E-02	9.87E-04	9.14E-02	0.91	0.91
898	1.63E-02	0.944	1.54E-02	1.59E-02	6.97E-04	8.77E-02	1.03	0.97
1173	1.39E-02	0.934	1.30E-02	1.34E-02	5.43E-04	8.10E-02	1.04	0.97
1332	1.29E-02	0.93	1.20E-02	1.22E-02	5.81E-04	9.52E-02	1.06	0.99
1836	1.05E-02	0.925	9.69E-03	9.84E-03	4.67E-04	9.49E-02	1.06	0.98
ISOCSS								
				Wt. Mean	Ratio	Std Dev	Wt. Rel.	Std Dev
				Dataset	<150 keV	0.87	0.06	0.03
				>150 keV	0.95	0.04	0.04	0.04
				All	0.93	0.06	0.04	0.04

400 ML M.BEAKER (1.15 g/cc) ON A 60% DETECTOR

Date: August 10, 2000

ISOCS Version: v4.0

This is a 400 mL Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix S/N 98-22 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: Markku's 60%, New characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker						Container dimensions from the file 590g.BKR		
(2) Top layer	0.8					Epoxy	1.15	1
(3) Bottom layer	7.318					Epoxy	1.15	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

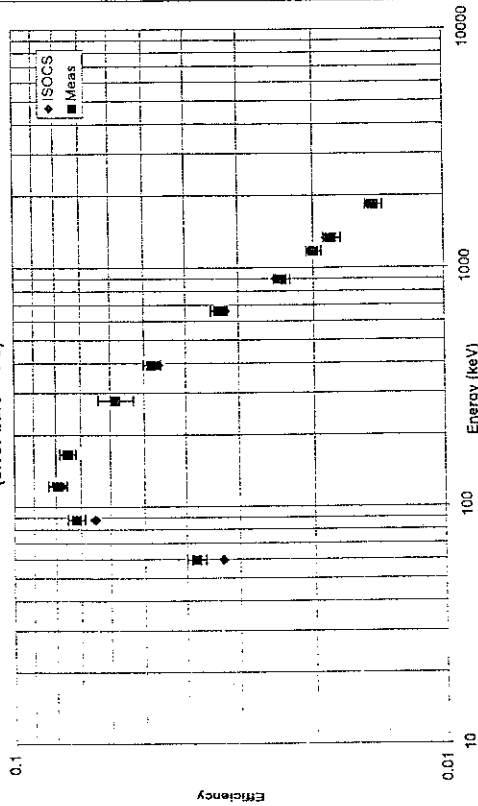
Units: Length: cm Density: g/cc

Source Material: 72.1%⁶⁰Co+21.9%¹³⁷Cs+6%¹⁵²Eu

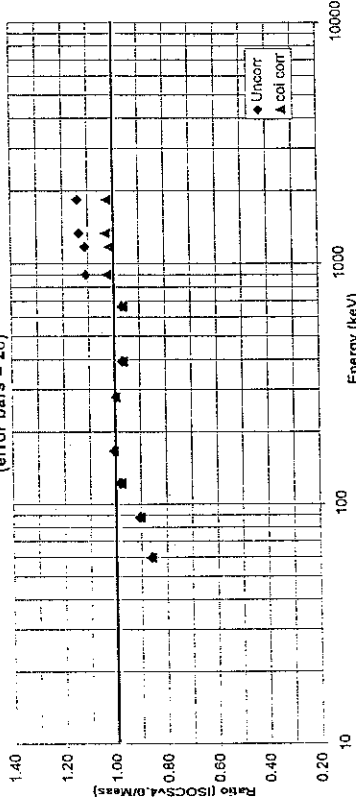
Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff. * COI	Measured efficiency 1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas) Corrected
59.84	3.29E-02	1	3.29E-02	3.81E-02	1.01E-01	0.86
88	6.51E-02	1	6.51E-02	7.19E-02	9.46E-02	0.91
122	7.78E-02	1	7.78E-02	7.96E-02	9.52E-02	0.98
165.9	7.55E-02	1	7.55E-02	7.52E-02	3.16E-03	1.00
279	5.81E-02	1	5.81E-02	5.84E-02	5.36E-03	0.99
392	4.63E-02	1	4.63E-02	4.80E-02	2.23E-03	0.97
662	3.22E-02	1	3.22E-02	3.34E-02	1.52E-03	0.97
898	2.64E-02	0.927	2.45E-02	2.38E-02	9.10E-02	1.11
1173	2.23E-02	0.914	2.04E-02	2.00E-02	8.09E-02	1.02
1332	2.06E-02	0.908	1.87E-02	1.81E-02	8.64E-04	1.14
1836	1.65E-02	0.901	1.49E-02	1.45E-02	6.84E-04	1.14
Wt. Mean Ratio						0.98
Dataset Ratio						0.91
<150 keV						0.06
>150 keV						1.00
All						0.98
ISOCS Wt. Rel. Std Dev						0.03
Ratio Std Dev						0.04
ISOCS Std Dev						0.03
Ratio Std Dev						0.03

400 ML MARINELLI BEAKER (1.15 g/cc)

(error bars = 1 σ)

400 ML MARINELLI BEAKER (1.15 g/cc)

(error bars = 2 σ)

400 ML M.BEAKER (1.6 g/cc) ON A 60% DETECTOR

Date: August 10, 2000 ISOCS Version: v4.0

This is a 400 mL Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.
The measured efficiencies were obtained with beaker/matrix S/N 96-23 mixed gamma source.

ISOCS Geometry Parameters

Template: BEAKER

Detector: Markku's 60%, New characterization

Collimator: NONE

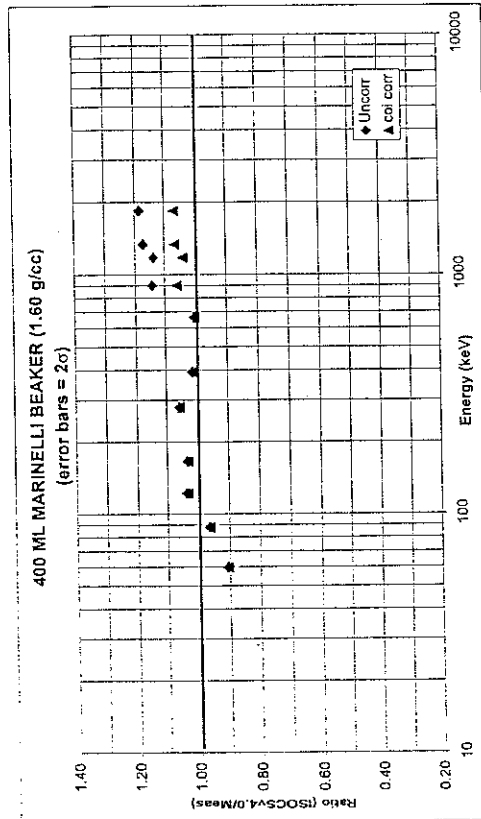
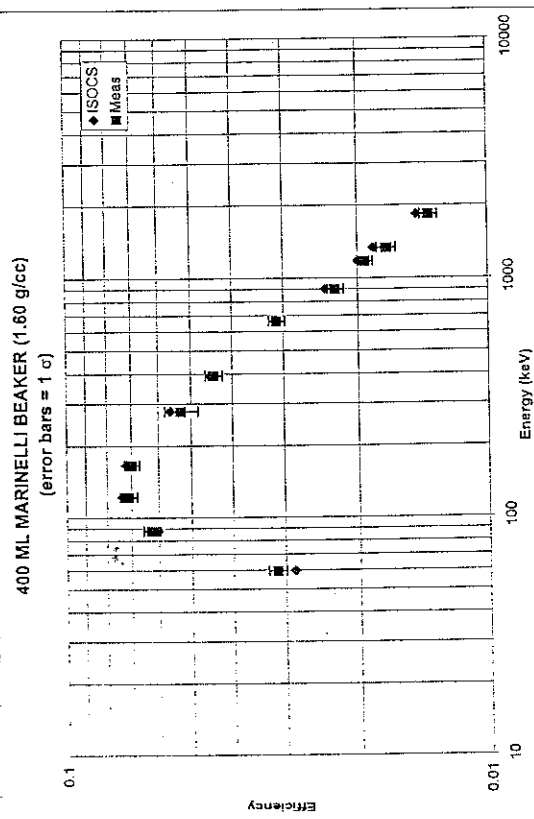
Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Beaker	1							
(2) Top layer						HDEpoxy	1.6	1
(3) Bottom layer	7.318					HDEpoxy	1.6	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	0							

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

Source Material: 72.1%C+21.9%O+6%H



Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff * COI	efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)	Corrected
59.64	2.86E-02	1	2.86E-02	3.15E-02	1.60E-03	1.02E-01	0.91	0.91
88	6.04E-02	1	6.04E-02	6.26E-02	2.97E-03	9.49E-02	0.96	0.96
122	7.37E-02	1	7.37E-02	7.12E-02	3.38E-03	9.49E-02	1.04	1.04
165.9	7.21E-02	1	7.21E-02	6.98E-02	2.91E-03	8.34E-02	1.03	1.03
279	5.61E-02	1	5.61E-02	5.30E-02	4.83E-03	1.82E-01	1.06	1.06
392	4.49E-02	1	4.49E-02	4.42E-02	2.03E-03	9.19E-02	1.02	1.02
682	3.14E-02	1	3.14E-02	3.12E-02	1.42E-03	9.10E-02	1.01	1.01
898	2.59E-02	0.927	2.40E-02	2.26E-02	9.94E-04	8.80E-02	1.15	1.06
1173	2.19E-02	0.914	2.00E-02	1.92E-02	7.79E-04	8.11E-02	1.14	1.04
1332	2.02E-02	0.908	1.83E-02	1.72E-02	8.14E-04	9.47E-02	1.17	1.07
1836	1.63E-02	0.901	1.47E-02	1.37E-02	6.46E-04	9.43E-02	1.19	1.07
				Wt. Mean				
				Dataset	Ratio	Std Dev	Wt. Rel.	ISOCS
				<150 keV	0.93	0.06		Std Dev
				>150 keV	1.05	0.02		0.06
				All	1.04	0.04		0.02
								0.04

POINT SOURCE AT 0 DEGREES AND 10CM

Date: August 10, 2000

ISOCSS Version: v4.0

The two point sources each consists of a 1mm resin bead that contains the activity.
 The bead is epoxied in the center of a 25.4mm diameter by 6.35mm thick plastic disc.
 The sources 93-35, Eu-152 and 8375-8, Am-241, were placed side by side horizontally.

ISOCSS Geometry Parameters

Template: COMPLEX BOX

Detector: 42% (SN 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Conc.
(1) Box	2.54	2.54	2.54	0.635					
(5) Bottom layr.	2.54	0.1	0.1	1.22	1.22	0.2675	Polyprop	0.9	
(6) Source-Con.	0.1	0.1	0.1	1.22	1.22	0.2675	Epoxy	1.07	1
(7) Absorber 1									
(8) Absorber 2									
(9) Src-Det	10	0	0	0	0	0			

Air. Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

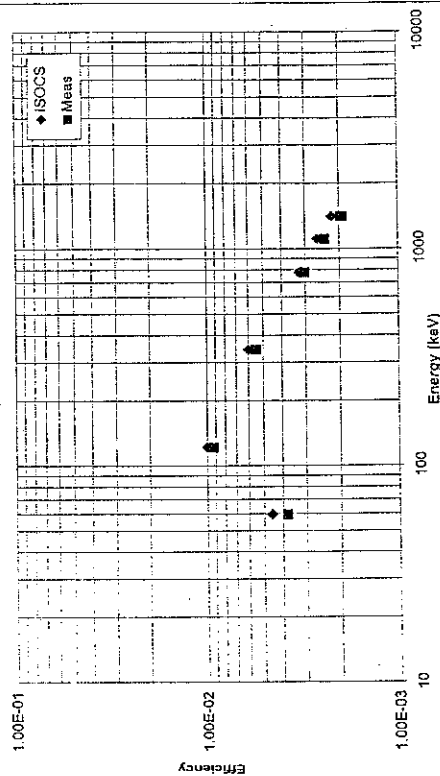
Convergence: 1%

Units: Length: cm Density: g/cc

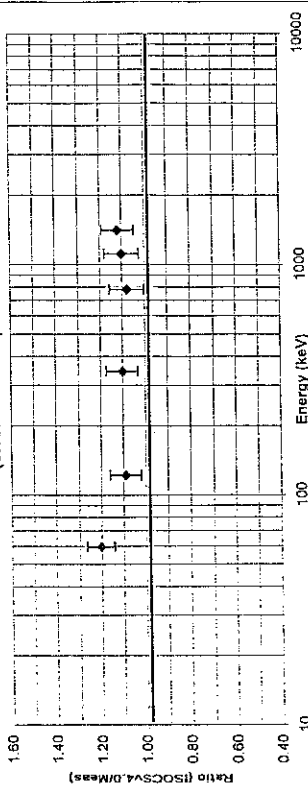
Box Material: H6_C3

Source Material: 72.1%C+21.9%O+6%H

POINT SOURCE AT 0D AND 10CM

(error bars = 1 σ)

POINT SOURCE AT 0D AND 10CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCSS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCSS/Measured)
59.54	4.56E-03	3.79E-03	1.20E-04	6.33E-02	1.20
121.78	1.01E-02	9.25E-03	3.15E-04	8.81E-02	1.09
344.28	6.02E-03	5.45E-03	1.88E-04	6.89E-02	1.10
778.9	3.26E-03	3.02E-03	1.14E-04	7.55E-02	1.08
1112.12	2.61E-03	2.37E-03	9.08E-05	7.66E-02	1.10
1408.01	2.18E-03	1.95E-03	7.07E-05	7.25E-02	1.12
Wt. Mean Ratio					1.15
Dataset					<150keV
Std. Dev.					0.07
Dataset					>150keV
Std. Dev.					0.06
All					1.12
Std. Dev.					0.04
All					0.02

POINT SOURCE AT 0 DEGREES AND 100CM

Date: August 10, 2000

ISOS Version: v4.0

The two point sources each consists of a 1mm resin bead that contains the activity. The bead is epoxied in the center of a 25.4mm diameter by 6.35mm thick plastic disc. The sources 93-35, Eu-152 and 8375-8, Am-241, were placed side by side horizontally.

ISOS Geometry Parameters

Template: COMPLEX BOX

Detector: 42% (SIN 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Conc
(1) Box		2.54	2.54	0.635			Polyprop	0.9	
(5) Bottom layr							Epoxy	1.07	1
(6) Source-Con.	0.1	0.1	0.1	1.22	1.22	0.2675			
(7) Absorber 1									
(8) Absorber 2									
(9) Src-Det	100	0	0	0	0				

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

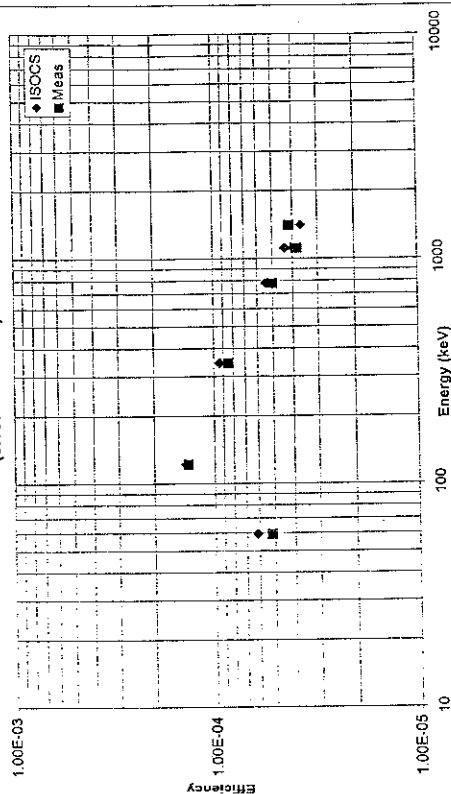
Convergence: 1%

Units: Length: cm Density: g/cc

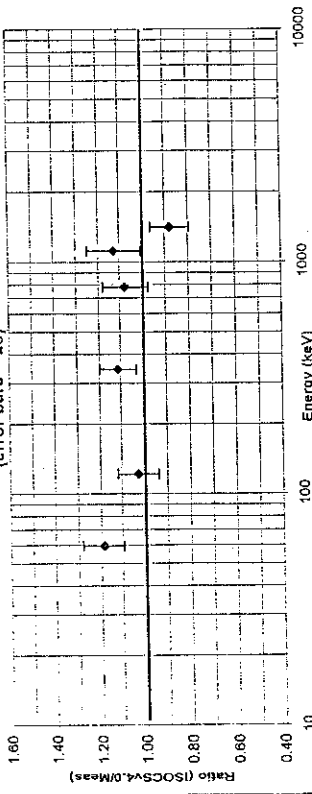
Box Material: H6_C3

Source Material: 72.1%C+21.9%O+6%H

POINT SOURCE AT 0D AND 100CM

(error bars = 1 σ)

POINT SOURCE AT 0D AND 100CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOS efficiency	Measured efficiency	1 σ unc.	2 σ rel. unc.	Ratio (ISOS/Measured)
59.54	6.18E-05	5.20E-05	2.43E-06	9.35E-02	1.19
121.78	1.40E-04	1.36E-04	6.09E-06	8.96E-02	1.03
344.28	9.40E-05	8.43E-05	3.56E-06	8.45E-02	1.12
778.9	5.43E-05	5.03E-05	2.58E-06	1.03E-01	1.08
1112.12	4.34E-05	3.85E-05	2.34E-06	1.22E-01	1.13
1408.01	3.65E-05	4.15E-05	1.77E-06	8.53E-02	0.88
Wt. Mean					
Dataset					
<150keV					1.09
>150keV					1.01
All					1.04
Isots					
Std. Dev.					
<150keV					0.10
>150keV					0.13
All					0.12
Std. Dev.					
<150keV					0.09
>150keV					0.12
All					0.11

POINT SOURCE AT 45 DEGREES AND 10CM

Date: August 10, 2000

ISOCS Version: v4.0

The two point sources each consists of a 1mm resin bead that contains the activity. The bead is epoxied in the center of a 25.4mm diameter by 6.35mm thick plastic disc. The sources 93-35, Eu-152 and 8375-8, Am-241, were placed side by side horizontally.

ISOCS Geometry Parameters

Template: COMPLEX BOX

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Conc
(1) Box		2.54	2.54	0.635			Polyprop	0.9	
(5) Bottom layer	2.54						Epoxy	1.07	1
(6) Source-Con.	0.1	0.1	0.1	1.22	1.22	0.2875			
(7) Absorber 1									
(8) Absorber 2									
(9) Src-Det	10	0	0	10	0				

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

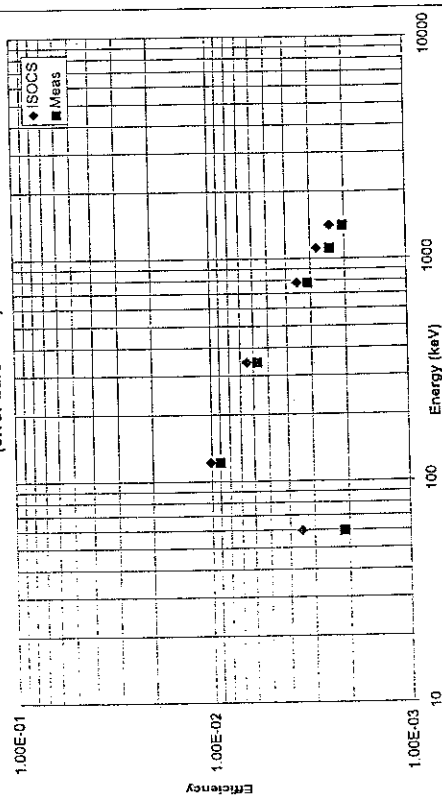
Convergence: 1%

Units: Length: cm Density: g/cc

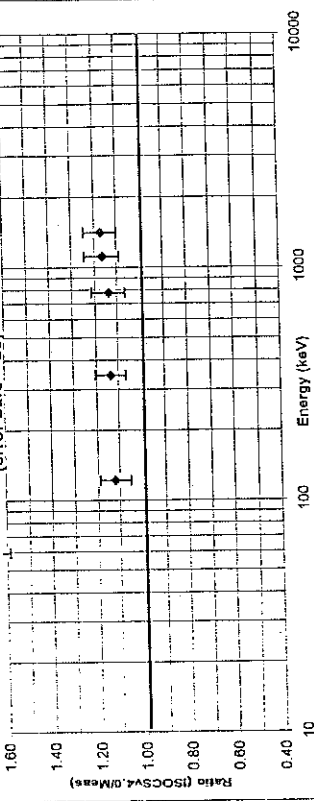
Box Material: H6_C3

Source Material: 72.1%C+21.9%O+6%H

POINT SOURCE AT 45D AND 10CM

(error bars = 1 σ)

POINT SOURCE AT 45D AND 10CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCS/Measured)
59.54	3.51E-03	2.12E-03	7.10E-05	6.70E-02	1.65
121.78	1.01E-02	9.03E-03	3.08E-04	6.82E-02	1.12
344.28	6.48E-03	5.70E-03	1.96E-04	6.88E-02	1.14
778.9	3.58E-03	3.12E-03	1.17E-04	7.50E-02	1.14
1112.12	2.79E-03	2.39E-03	9.35E-05	7.82E-02	1.17
1408.01	2.39E-03	2.04E-03	7.44E-05	7.29E-02	1.17
Wt. Mean					
		Ratio	Std. Dev.	Wt. Rel.	Isocs
Dataset					
<150keV		1.29	0.27	0.27	
>150keV		1.15	0.02	0.02	
All		1.20	0.14	0.14	

POINT SOURCE AT 45 DEGREES AND 100CM

Date: August 10, 2000

ISOCSS Version: v4.0

The two point sources each consists of a 1mm resin bead that contains the activity.
The bead is epoxied in the center of a 25.4mm diameter by 6.35mm thick plastic disc.
The sources 93-35, Eu-152 and 8375-8, Am-241, were placed side by side horizontally.

ISOCSS Geometry Parameters

Template: COMPLEX BOX

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Conc
(1) Box		2.54	2.54	0.635					
(5) Bottom layer	2.54						Polyprop	0.9	
(6) Source-Con.	0.1	0.1	0.1	1.22	1.22	0.2675	Epoxy	1.07	1
(7) Absorber 1									
(8) Absorber 2									
(9) Src-Det	100	0	0		0				

Air Temp: 20 C Rel Hum: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Box Material: H6_C3

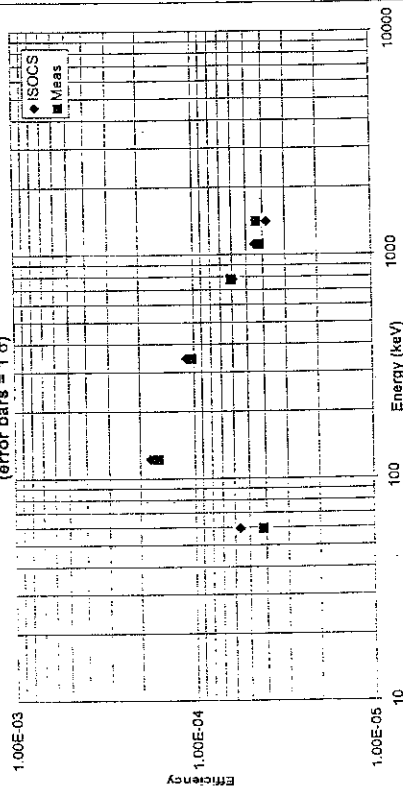
Source Material: 72.1%C+21.9%O+6%H

Comparison Results

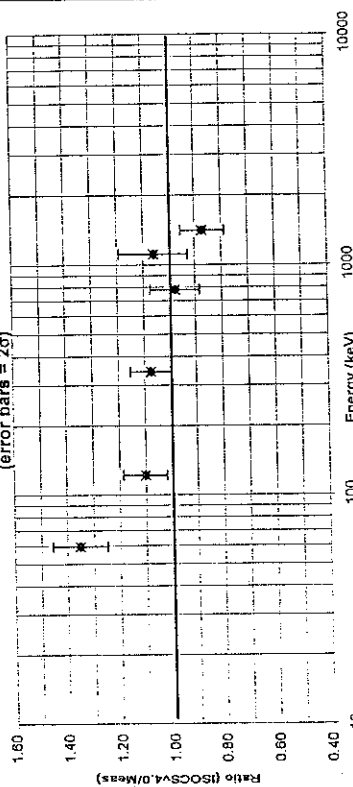
Energy (keV)	ISOCSS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCSS/Measured)
59.54	5.66E-05	4.18E-05	2.17E-06	1.04E-01	1.35
121.78	1.77E-04	1.60E-04	6.63E-06	8.29E-02	1.10
344.28	1.11E-04	1.03E-04	4.04E-06	7.84E-02	1.08
778.9	5.97E-05	6.09E-05	2.89E-06	9.49E-02	0.98
1112.12	4.50E-05	4.24E-05	2.80E-06	1.32E-01	1.06
1408.01	3.81E-05	4.37E-05	1.83E-06	8.38E-02	0.87

Dataset	Wt. Mean Ratio	Wt. Rel. Std. Dev.	Isocss Std. Dev.
<150keV	1.18	0.14	0.13
>150keV	0.97	0.10	0.09
All	1.03	0.14	0.13

POINT SOURCE AT 45D AND 100CM

(error bars = 1 σ)

POINT SOURCE AT 45D AND 100CM

(error bars = 2 σ)

POINT SOURCE AT 90 DEGREES AND 10CM
Date: August 10, 2000
ISOSCS Version: v4.0

The two point sources each consists of a 1mm resin bead that contains the activity. The bead is epoxied in the center of a 25.4mm diameter by 6.35mm thick plastic disc. The sources 93-35, Eu-152 and 8375-8, Am-241, were placed side by side horizontally.

ISOSCS Geometry Parameters

Template: COMPLEX BOX
Detector: 42% (S/N 3578), New Characterization

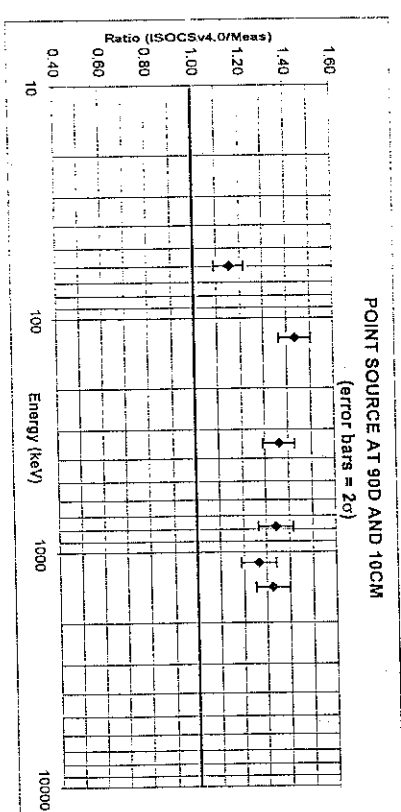
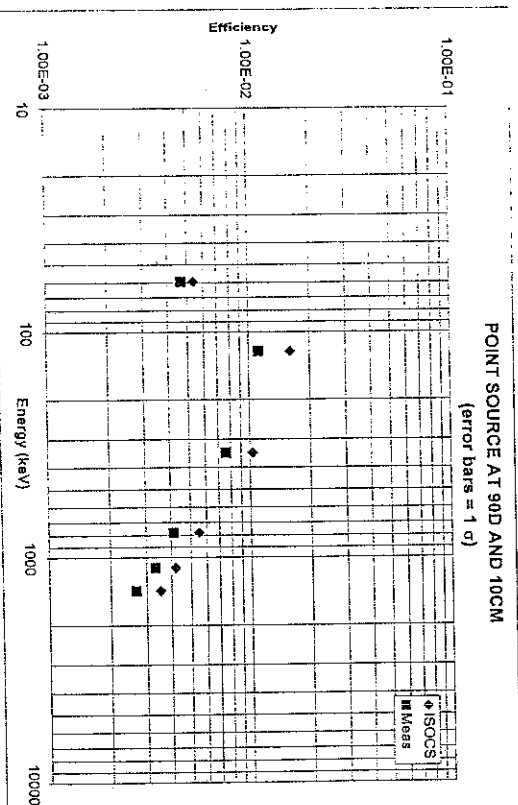
Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Conc
(1) Box									
(5) Bottom layer	2.54	2.54	2.54	0.635			Polypop	0.9	
(6) Source-Con.	0.1	0.1	0.1	1.22	1.22	0.2675	Epoxy	1.07	1
(7) Absorber 1									
(8) Absorber 2									
(9) Src-Det	10	0	0	99999	0				

Air Temp: 20 C Rel. Hum: 50% Bar. Press: 760 mm Hg
Convergence: 1%
Units: Length: cm Density: g/cc
Box Material: H9_C3
Source Material: 72.1%C+21.9%O+6%H

Comparison Results

Energy (keV)	ISOSCS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	(ISOSCS/Measured)	Ratio
59.54	5.37E-03	4.86E-03	1.48E-04	6.35E-02	1.15	1.15
121.78	1.59E-02	1.11E-02	3.80E-04	6.85E-02	1.43	1.43
344.28	1.03E-02	7.55E-03	2.59E-04	6.85E-02	1.36	1.36
778.9	5.48E-03	4.09E-03	1.54E-04	7.53E-02	1.34	1.34
1112.12	4.18E-03	3.31E-03	1.27E-04	7.67E-02	1.26	1.26
1408.01	3.51E-03	2.66E-03	9.61E-05	7.25E-02	1.32	1.32
Dataset						Ratio
<150keV						1.25
>150keV						1.32
All						1.29
Wt.Mean						Ratio
<150keV						1.25
>150keV						1.32
All						1.29



POINT SOURCE AT 90 DEGREES AND 100CM

Date: August 10, 2000

ISOCSS Version: v4.0

The two point sources each consists of a 1mm resin bead that contains the activity. The bead is epoxied in the center of a 25.4mm diameter by 6.35mm thick plastic disc. The sources 93-35, Eu-152 and 8375-8, Am-241, were placed side by side horizontally.

ISOCSS Geometry Parameters

Template: COMPLEX BOX

Detector: 42% (S/N 3578), New Characterization

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	d.6	Material	Density	Conc
(1) Box		2.54	2.54	0.635					
(5) Bottom layer	2.54						Polyprop	0.9	
(6) Source-Con.	0.1	0.1	0.1	1.22	1.22	0.2875	Epoxy	1.07	1
(7) Absorber 1									
(8) Absorber 2									
(9) Src-Det	100	0	0	99999	0				

Air Temp: 20 C Rel Hum: 50% Bar. Press.: 760 mm Hg

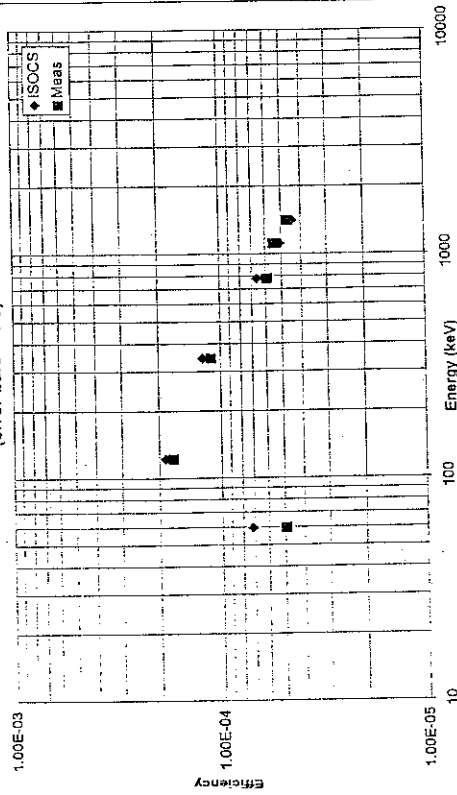
Convergence: 1%

Units: Length: cm Density: g/cc

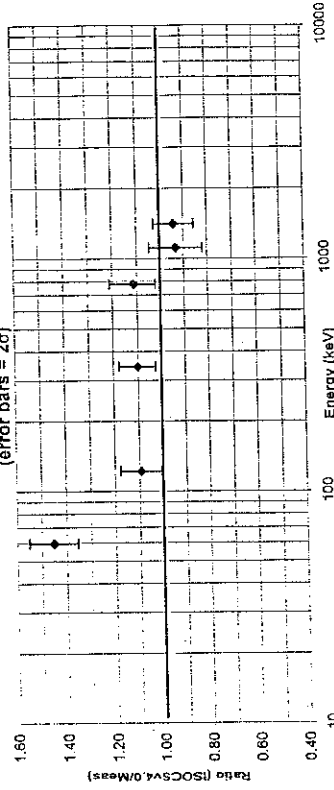
Box Material: H6_C3

Source Material: 72.1%C+21.9%O+6%H

POINT SOURCE AT 90D AND 100CM

(error bars = 1 σ)

POINT SOURCE AT 90D AND 100CM

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCSS efficiency	Measured efficiency	1 σ unc	2 σ rel. unc	Ratio (ISOCSS/Measured)
59.54	7.20E-05	4.96E-05	2.40E-06	9.68E-02	1.45
121.78	1.87E-04	1.71E-04	7.42E-06	8.68E-02	1.09
344.28	1.22E-04	1.11E-04	4.31E-06	7.77E-02	1.10
778.9	6.60E-05	5.92E-05	2.85E-06	9.63E-02	1.12
1112.12	5.10E-05	5.47E-05	3.06E-06	1.12E-01	0.93
1408.01	4.44E-05	4.72E-05	1.96E-06	8.31E-02	0.94

Dataset	Wt. Mean	Ratio	Std. Dev.	ISOCSS Std. Dev.
<150keV	1.20	1.20	0.20	0.19
>150keV	1.02	1.02	0.10	0.08
All	1.06	1.06	0.14	0.13

20ML VIAL ON SHELF 0 OF TVA DETECTOR 1765

Date: August 10, 2000

ISOCSS Version: v4.0

The source consist of one 20 mL LSC vial.

The vial is positioned end-on to the detector, and centered on the endcap front face.

ISOCSS Geometry Parameters

Template: CIRCULAR PLANE

Detector: TVA 3175 (New DCG Calibration)

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.089	2.55				PolyProp	0.9	
(2) Lay 1	0.127					PolyProp	0.9	
(3) Lay 2	4.879					Epoxy	1.15	1
(4-11) Lay 3-10								
(12) Absorber 1	0.564					Polyprop	0.9	
(13) Absorber 2								
(14) Src-Det	0.565	0	0	0	0			

Air: Temp: 20 C Rel Hum: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%¹⁴H+72.1%C

Comparison Results

Energy (keV)	ISOCSS efficiency	COI factor	ISOCSS eff * COI	efficiency	Measured 1 σ unc	2 σ rel. unc (ISOCSS/Meas)	Ratio	Corr. Ratio
59.54	1.54E-02	1	1.54E-02	1.47E-02	7.53E-04	0.10	1.05	1.05
88.03	3.33E-02	1	3.33E-02	3.45E-02	1.65E-03	0.10	0.97	0.97
122.06	3.90E-02	1	3.90E-02	3.91E-02	1.66E-03	0.08	1.00	1.00
165.85	3.52E-02	1	3.52E-02	3.52E-02	1.49E-03	0.08	1.00	1.00
279.19	2.35E-02	1	2.35E-02	2.27E-02	1.07E-03	0.09	1.03	1.03
391.69	1.70E-02	1	1.70E-02	1.69E-02	8.26E-04	0.10	1.01	1.01
513.99	1.33E-02	1.00	1.33E-02	1.31E-02	6.55E-04	0.10	1.02	1.02
651.65	1.08E-02	1.00	1.08E-02	1.05E-02	4.69E-04	0.09	1.03	1.03
898.02	8.52E-03	0.96	8.19E-03	7.47E-03	3.18E-04	0.09	1.14	1.10
1173.22	6.90E-03	0.96	6.63E-03	6.00E-03	2.90E-04	0.10	1.15	1.11
1332.49	6.32E-03	0.96	6.06E-03	5.34E-03	2.32E-04	0.09	1.18	1.13
1836.01	4.72E-03	0.95	4.48E-03	4.05E-03	1.72E-04	0.08	1.16	1.11

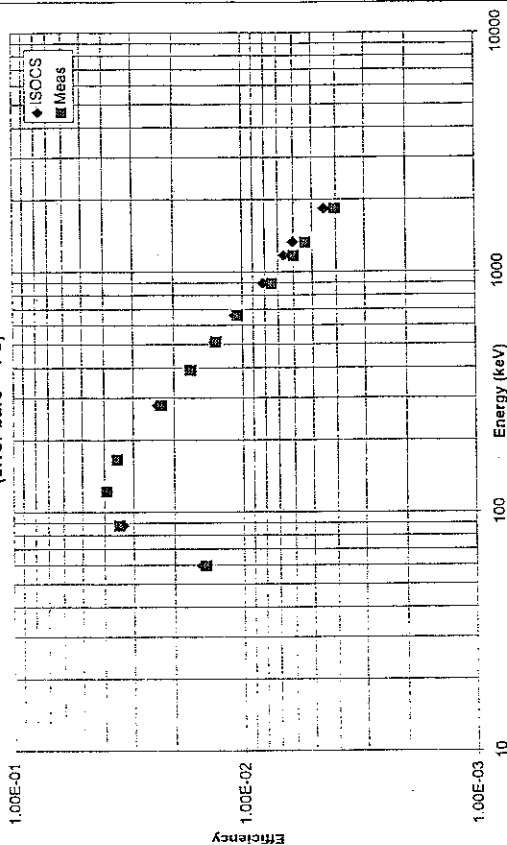
Dataset	Wt. Mean		Wt. Rel.		Isocs	
	Ratio	Std. Dev.	Ratio	Std. Dev.	Ratio	Std. Dev.
<150keV	1.00	0.04	1.00	0.04	1.00	0.02
>150keV	1.06	0.05	1.06	0.05	1.06	0.03
All	1.04	0.05	1.04	0.05	1.04	0.03

The ISOCSS efficiencies for Co-60 and Y-88

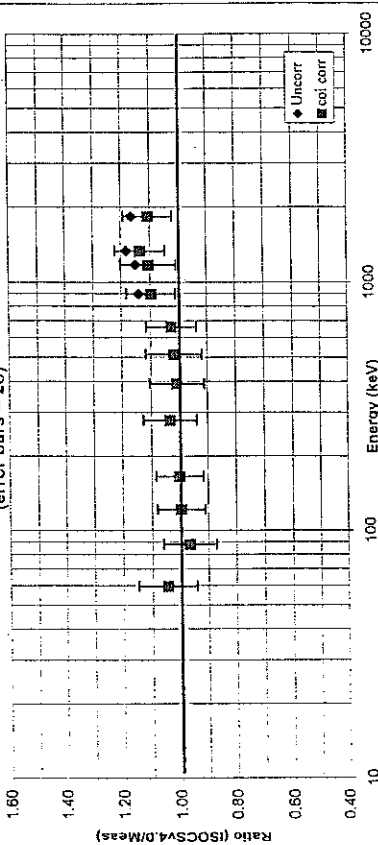
have been reduced to take into account the

coincidence summing losses.

20 mL LSC VIAL ON SHELF 0

(error bars = 1 σ)

20 mL LSC VIAL ON SHELF 0

(error bars = 2 σ)

20ML VIAL ON SHELF 1 OF TVA DETECTOR 1765

Date: August 10, 2000

ISOCS Version: v4.0

The source consist of one 20 mL LSC vial.

The vial is positioned end-on to the detector, and centered on the endcap front face.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

Detector: TVA 3175 (New DCG Calibration)

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.089	2.55				PolyProp	0.9	
(2) Lay 1	0.127					PolyProp	0.9	
(3) Lay 2	4.88					Epoxy	1.15	1
(4-11) Lay 3-10								
(12) Absorber 1	0.318					Polyprop	0.9	
(13) Absorber 2	0.478					Polyprop	0.9	
(14) Src-Det	3.02	0	0	0	0			

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%H+72.1%C

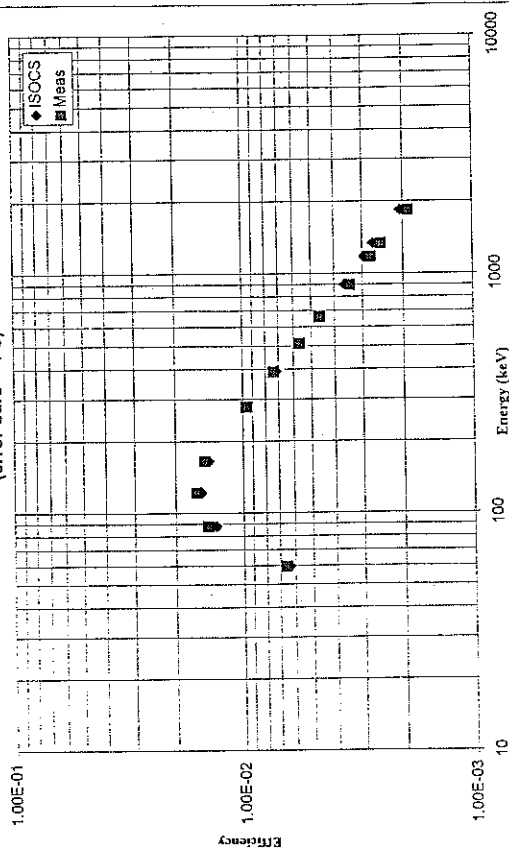
Comparison Results

Energy (keV)	ISOCS efficiency	COI factor	ISOCS eff * COI	efficiency	Measured 1 σ unc	2 σ rel. unc	Ratio (ISOCS/Meas)	Corr. Ratio
59.54	6.36E-03	1	6.36E-03	6.60E-03	3.38E-04	0.10	0.98	0.98
88.03	1.33E-02	1	1.33E-02	1.44E-02	6.84E-04	0.10	0.92	0.92
122.06	1.54E-02	1	1.54E-02	1.61E-02	6.81E-04	0.08	0.96	0.96
165.85	1.43E-02	1	1.43E-02	1.48E-02	6.28E-04	0.08	0.96	0.96
279.19	9.62E-03	1	9.62E-03	9.66E-03	4.60E-04	0.10	1.00	1.00
391.69	7.19E-03	1	7.19E-03	7.35E-03	3.53E-04	0.10	0.98	0.98
513.99	5.71E-03	1.00	5.71E-03	5.66E-03	2.86E-04	0.10	1.01	1.01
661.65	4.63E-03	1.00	4.63E-03	4.61E-03	2.06E-04	0.09	1.01	1.01
898.02	3.68E-03	0.98	3.62E-03	3.42E-03	1.46E-04	0.09	1.08	1.06
1173.22	3.00E-03	0.98	2.95E-03	2.77E-03	1.34E-04	0.10	1.08	1.06
1332.49	2.74E-03	0.98	2.69E-03	2.48E-03	1.07E-04	0.09	1.10	1.08
1936.01	2.10E-03	0.98	2.06E-03	1.89E-03	8.13E-05	0.09	1.11	1.09
Wt. Mean							Ratio	Std. Dev.
Dataset							Ratio	Std. Dev.
<150keV							0.95	0.02
>150keV							1.03	0.03
All							1.00	0.04

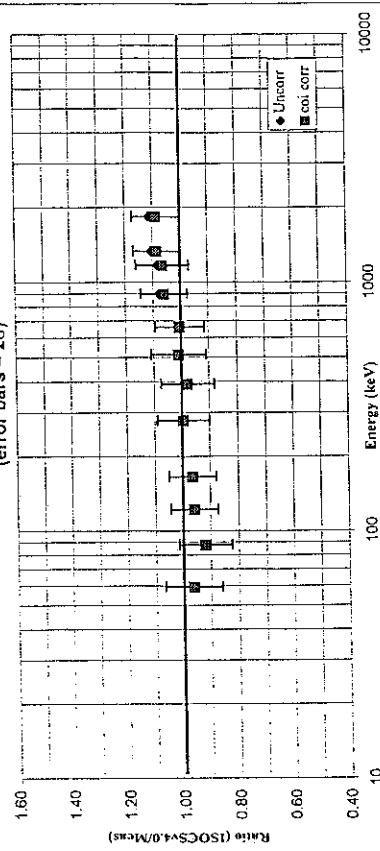
The ISOCS efficiencies for Co-60 and Y-88

have been reduced to take into account the coincidence summing losses.

20 mL LSC VIAL ON SHELF 1

(error bars = 1 σ)

20 mL LSC VIAL ON SHELF 1

(error bars = 2 σ)

20ML VIAL ON SHELF 2 OF TVA DETECTOR 1765

Date: August 10, 2000

ISOCSS Version: v4.0

The source consist of one 20 mL LSC vial.

The vial is positioned end-on to the detector, and centered on the endcap front face.

ISOCSS Geometry Parameters

Template: CIRCULAR PLANE

Detector: TVA 3175 (New DCG Calibration)

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Contc.
(1) Side Wall	0.089	2.55				PolyProp	0.9	
(2) Lay 1	0.127					PolyProp	0.9	1
(3) Lay 2	4.88					Epoxy	1.15	
(4-11) Lay 3-10						Polyprop	0.9	
(12) Absorber 1	0.318					Polyprop	0.9	
(13) Absorber 2	0.476					Polyprop	0.9	
(14) Src-Det	9.68	0	0	0	0			

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: 21.9%O+6%⁶⁰H+72.1%⁶⁰C

Comparison Results

Energy (keV)	ISOCSS efficiency	ISOCSS COI factor	ISOCSS eff * COI	efficiency	Measured 1 σ unc	2 σ rel. unc	Ratio (ISOCSS/Meas)	Ratio	Corr. Ratio
59.54	1.54E-03	1	1.54E-03	1.58E-03	7.98E-05	0.10	0.97	0.97	0.97
88.03	3.17E-03	1	3.17E-03	3.23E-03	1.58E-04	0.10	0.98	0.98	0.98
122.06	3.76E-03	1	3.76E-03	3.85E-03	1.63E-04	0.08	0.98	0.98	0.98
165.85	3.60E-03	1	3.60E-03	3.69E-03	1.57E-04	0.09	0.98	0.98	0.98
279.19	2.51E-03	1	2.51E-03	2.54E-03	1.21E-04	0.10	0.99	0.99	0.99
391.69	1.90E-03	1	1.90E-03	1.93E-03	9.38E-05	0.10	0.98	0.98	0.98
513.99	1.51E-03	1.00	1.51E-03	1.49E-03	7.53E-05	0.10	1.01	1.01	1.01
661.65	1.23E-03	1.00	1.23E-03	1.22E-03	5.42E-05	0.09	1.01	1.01	1.01
898.02	1.02E-03	1.00	1.02E-03	9.35E-04	3.96E-05	0.08	1.09	1.09	1.09
1173.22	8.39E-04	1.00	8.39E-04	7.57E-04	3.65E-05	0.10	1.11	1.11	1.11
1332.49	7.61E-04	1.00	7.61E-04	6.87E-04	2.98E-05	0.09	1.11	1.11	1.11
1836.01	5.45E-04	1.00	5.45E-04	5.85E-04	2.93E-05	0.10	0.93	0.93	0.93

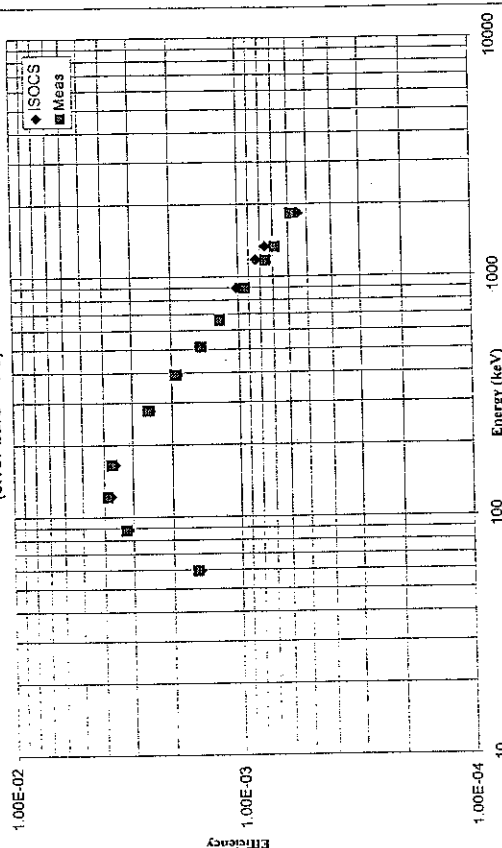
The ISOCSS efficiencies for Co-60 and Y-88

have been reduced to take into account the

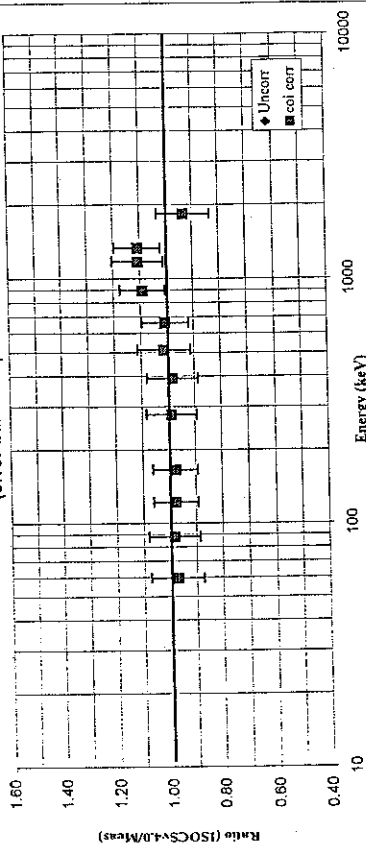
coincidence summing losses.

Dataset	Ratio	Wt. Mean	Std. Dev.	Isocs
<150keV	0.98	0.98	0.00	0.02
>150keV	1.02	1.02	0.06	0.04
All	1.01	1.01	0.06	0.03

20 mL LSC VIAL AT SHELF 2

(error bars = 1 σ)

20 mL LSC VIAL AT SHELF 2

(error bars = 2 σ)

GA-MA RG-25 VIAL ON SHELF 1 OF TVA DETECTOR 1765

Date: August 10, 2000

ISOCs Version: v4.0

The source consist of one 25 mL GA-MA RG-25 vial.

The vial is positioned end-on to the detector, and centered on the endcap front face.

ISOCs Geometry Parameters

Template: CIRCULAR PLANE

Detector: TVA 3175 (New DCG Calibration)

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0.203	5.41				Polystm	1.06	
(2) Lay 1	0.127					Polystm	1.06	
(3) Lay 2	1.12					Dryair	0.0013	1
(4-11) Lay 3-10								
(12) Absorber 1	0.318					Polyprop	0.9	
(13) Absorber 2	0.476					Polyprop	0.9	
(14) Src-Det	3.02	0	0	0	0			

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: 21.9%O+8%H+72.1%C

Comparison Results

Energy (keV)	ISOCs efficiency	COI factor	ISOCs eff * COI	efficiency	Measured 1 σ unc	2 σ rel. unc	Ratio (ISOCs/Meas)	Ratio	Corr. Ratio
59.54	1.20E-02	1	1.20E-02	1.22E-02	6.09E-04	0.10	0.99	0.99	0.99
88.03	2.51E-02	1	2.51E-02	2.63E-02	1.27E-03	0.10	0.95	0.95	0.95
122.06	2.90E-02	1	2.90E-02	2.95E-02	1.24E-03	0.08	0.98	0.98	0.98
165.85	2.65E-02	1	2.65E-02	2.66E-02	1.12E-03	0.08	1.00	1.00	1.00
278.19	1.72E-02	1	1.72E-02	1.72E-02	8.08E-04	0.09	1.00	1.00	1.00
391.69	1.24E-02	1	1.24E-02	1.24E-02	6.02E-04	0.10	1.00	1.00	1.00
513.99	9.72E-03	1.00	9.72E-03	9.40E-03	4.75E-04	0.10	1.03	1.03	1.03
661.65	7.85E-03	1.00	7.85E-03	7.50E-03	3.36E-04	0.09	1.05	1.05	1.05
898.02	6.11E-03	0.95	5.80E-03	5.47E-03	2.34E-04	0.09	1.12	1.12	1.08
1173.22	4.97E-03	0.94	4.67E-03	4.32E-03	2.09E-04	0.10	1.15	1.15	1.08
1332.49	4.45E-03	0.94	4.18E-03	3.82E-03	1.66E-04	0.09	1.16	1.16	1.09
1836.01	3.28E-03	0.92	3.02E-03	2.87E-03	1.22E-04	0.09	1.14	1.14	1.05

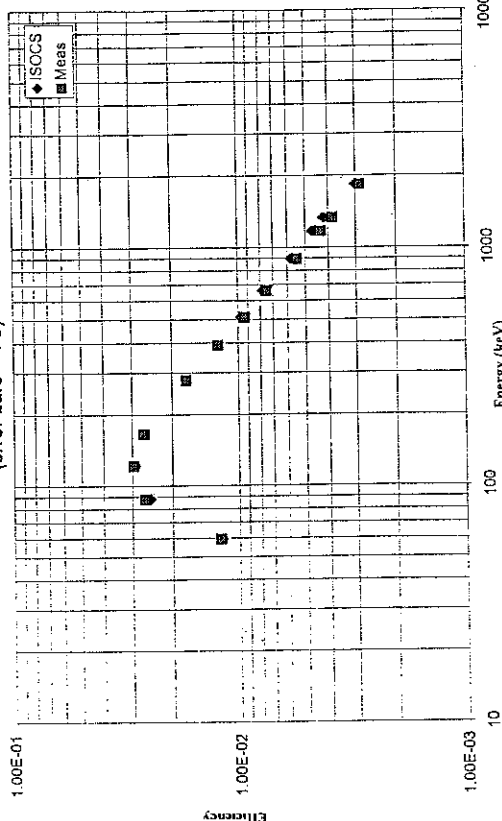
The ISOCs efficiencies for Co-60 and Y-88

have been reduced to take into account the

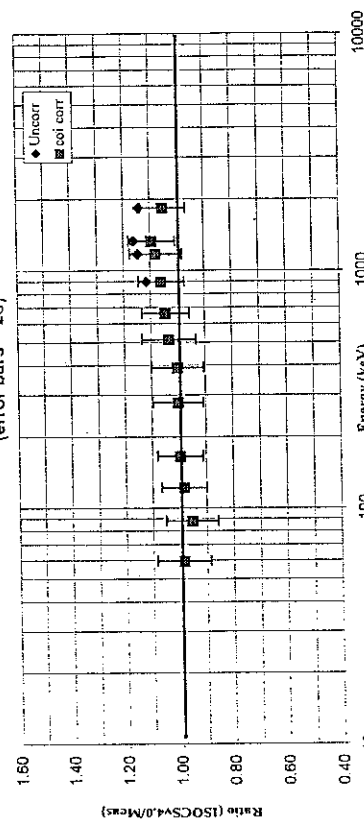
coincidence summing losses.

Dataset	Ratio	Wt. Mean	Wt. Rel.	Std. Dev.	Isocs
<150keV	0.97		0.02	0.02	
>150keV	1.04		0.03	0.03	
All	1.02		0.04	0.04	

25 cc GA-MA RG-25 VIAL ON SHELF 1

(error bars = 1 σ)

25 cc GA-MA RG-25 VIAL ON SHELF 1

(error bars = 2 σ)

1 LITER MARINELLI BEAKER (1.15 g/cc) TVA DETECTOR 1765

Date: August 10, 2000 ISOCS Version: v4.0

This is a 1 liter Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.

ISOCS Geometry Parameters

Template: MARINELLIWELL

Detector: TVA 3175 (New DOG Characterization)

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Liner Side	0.15	7.875	7.59			Polyprop	0.9	
(2) Liner End	0.15					Polyprop	0.9	
(3) Src - Side	1.5925					Epoxy	1.15	1
(4) Src - End	3.564					Epoxy	1.15	1
(5) Src-Det	0							

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

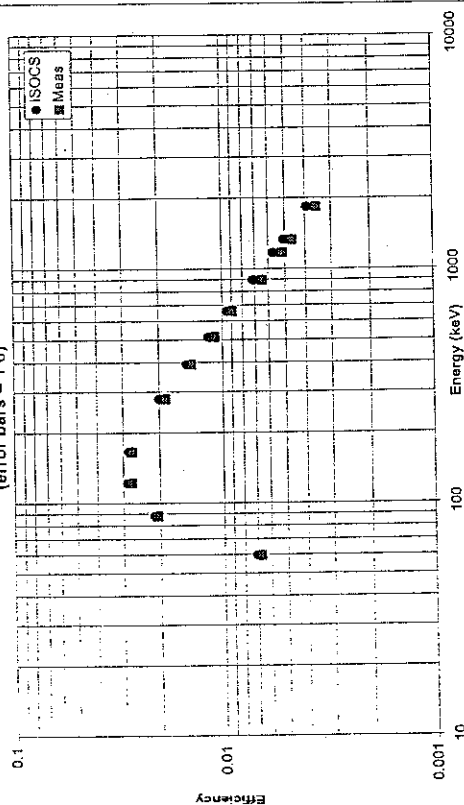
Units: Length: cm Density: g/cc

Source Material: 72.1%⁶⁰Co+21.9%¹³⁷Cs+6%¹³²I

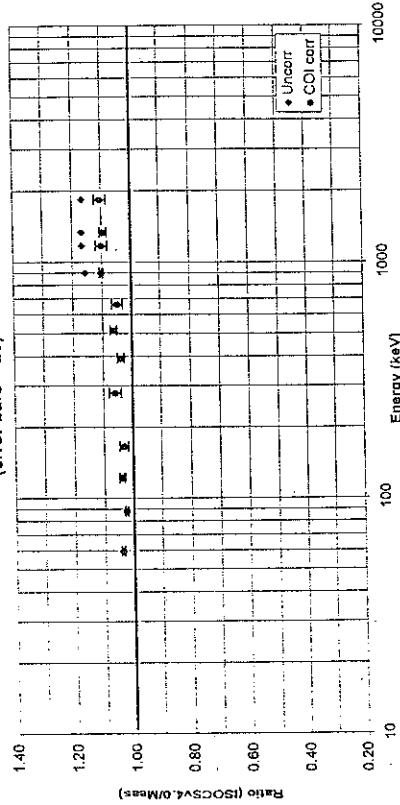
Comparison Results

Energy (keV)	ISOCS efficiency	ISOCS COI factor	ISOCS eff * COI	efficiency 1 σ unc	Measured 1 σ unc	2 σ rel unc	ISOCS/Measured Uncorr	Corrected
59.64	7.05E-03	1	7.05E-03	6.77E-03	1.82E-05	0.01	1.04	1.04
88	2.12E-02	1	2.12E-02	2.07E-02	5.69E-05	0.01	1.03	1.03
122	2.87E-02	1	2.87E-02	2.75E-02	1.25E-04	0.01	1.04	1.04
165.9	2.82E-02	1	2.82E-02	2.73E-02	1.97E-04	0.01	1.03	1.03
279	2.00E-02	1	2.00E-02	1.88E-02	1.95E-04	0.02	1.06	1.06
392	1.48E-02	1	1.48E-02	1.42E-02	7.94E-05	0.01	1.04	1.04
513.99	1.17E-02	1	1.17E-02	1.10E-02	8.03E-05	0.01	1.06	1.06
662	9.47E-03	1	9.47E-03	9.00E-03	7.91E-05	0.02	1.05	1.05
898	7.47E-03	0.95	7.11E-03	6.45E-03	1.73E-05	0.01	1.18	1.10
1173	6.03E-03	0.94	5.68E-03	5.16E-03	5.16E-05	0.02	1.17	1.10
1332	5.43E-03	0.94	5.08E-03	4.64E-03	2.83E-05	0.01	1.17	1.10
1836	4.15E-03	0.95	3.93E-03	3.55E-03	3.65E-05	0.02	1.17	1.11
Wt Rel.								ISOCS
				Dataset	Ratio	Std Dev	Std Dev	
				<150 keV	1.04	0.005	0.005	
				>150 keV	1.10	0.02	0.02	
				All	1.08	0.03	0.03	

1 LITER MARINELLI BEAKER (1.15 g/cc)

(error bars = 1 σ)

1 LITER MARINELLI BEAKER (1.15 g/cc)

(error bars = 2 σ)

4 LITER MARINELLI BEAKER (1.15 g/cc) TVA DETECTOR 1765

Date: August 10, 2000

ISOCS Version: v4.0

This is a 4 liter Marinelli beaker with 1.15 g/cc active matrix resting on the endcap of the detector.

ISOCS Geometry Parameters

Template: MARINELLIWELL

Detector: TVA 3175 (New DCG Characterization)

Collimator: NONE

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Liner Side	0.15	7.93	7.64			Polyprop	0.9	
(2) Liner End	0.15					Polyprop	0.9	
(3) Src - Side	5.11					Epoxy	1.15	1
(4) Src - End	6.7					Epoxy	1.15	1
(5) Src-Det	0							

Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

Source Material: 72.1%C+21.9%O+6%H

Comparison Results

Energy (keV)	ISOCS efficiency	ISOCS COI factor	ISOCS eff * COI	Measured efficiency	Measured 1 σ unc	Measured 2 σ rel unc	ISOCS/Measured Uncorr	Corrected
59.64	2.61E-03	1	2.61E-03	2.65E-03	1.82E-05	0.01	0.98	0.98
88	8.14E-03	1	8.14E-03	8.64E-03	5.69E-05	0.01	0.94	0.94
122	1.12E-02	1	1.12E-02	1.16E-02	1.25E-04	0.02	0.96	0.96
165.9	1.13E-02	1	1.13E-02	1.18E-02	1.97E-04	0.03	0.96	0.96
279	8.39E-03	1	8.39E-03	8.69E-03	1.95E-04	0.04	0.97	0.97
392	6.37E-03	1	6.37E-03	6.52E-03	7.94E-05	0.02	0.98	0.98
513.99	5.14E-03	1	5.14E-03	5.14E-03	6.03E-05	0.02	1.00	1.00
662	4.25E-03	1	4.25E-03	4.32E-03	7.91E-05	0.04	0.98	0.98
898	3.42E-03	0.98	3.37E-03	3.19E-03	1.73E-05	0.01	1.07	1.06
1173	2.80E-03	0.98	2.76E-03	2.61E-03	5.18E-05	0.04	1.06	1.07
1332	2.58E-03	0.98	2.52E-03	2.35E-03	2.83E-05	0.02	1.09	1.07
1836	1.99E-03	0.98	1.95E-03	1.83E-03	3.65E-05	0.04	1.09	1.07

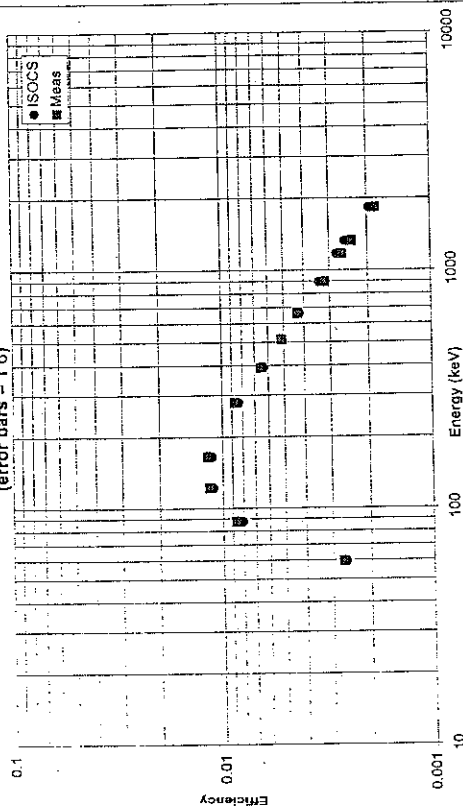
Wt. Mean	Wt. Rel.	ISOCS
Dataset	Std Dev	Std Dev

<150 keV 0.98 0.016 0.016

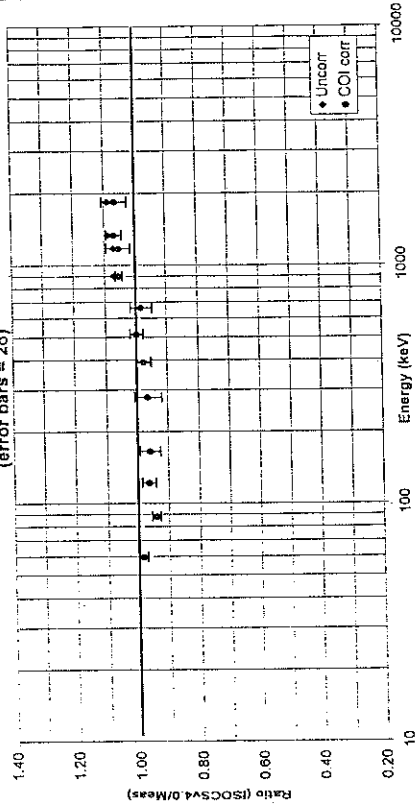
>150 keV 1.05 0.03 0.03

All 1.02 0.04 0.04

4 LITER MARINELLI BEAKER (1.15 g/cc)

(error bars = 1 σ)

4 LITER MARINELLI BEAKER (1.15 g/cc)

(error bars = 2 σ)

Appendix E: Data Sheets for Collimated Geometry Validation Test

This section contains the data sheets for the Collimated geometry tests. The format of data sheets is similar to those in the Filed and Laboratory geometry cases. In addition, the ISOCS input parameters for the shield and the collimator used in the tests are also given. These include the shield/collimator dimensions, the CPRN value, the shield/collimator material and its density.

20M LINE SOURCE, 50mm-180d CYLINDRICAL COLLIMATOR

Date: November 6, 2000 ISOCS Version: 4.0

A pipe 0.001 cm in diameter and 20 m in length is used to simulate a line source.
The detector is perpendicular to the pipe and aimed at the center of the pipe.
A collimator with 2 inch thick side shields and an opening angle of 180 degrees is used.

ISOCS Geometry Parameters

Template: PIPE

Detector: 42% (S/N 3578)

Collimator: 50mm-180d CRPN=4

1=0.2 2=3=4=0 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Pipe	0	0.001	1000	1000		H	0.0001	1
(2) Src 1	0.0005	1000	1000					
(3) Src 2								
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	100	0	0	0	0			

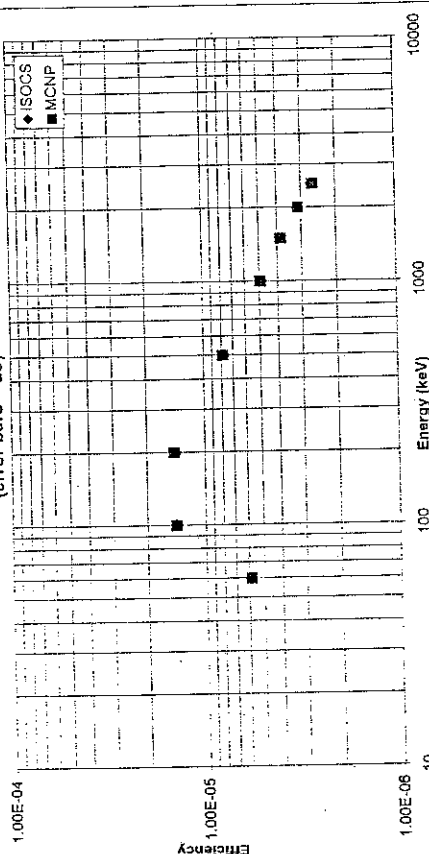
Air: Temp: 0 C Rel. Hum.: 0% Bar. Press.: 0 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

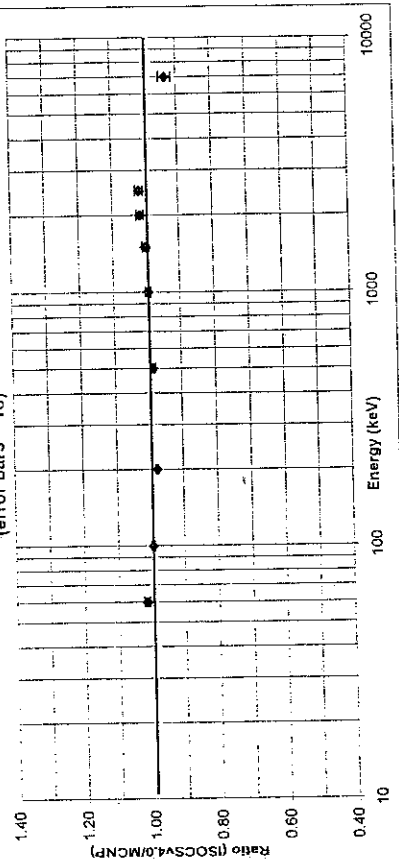
LINE SOURCE 20 METERS IN LENGTH, 180 DEG COLLIMATION

(error bars = 2σ)



LINE SOURCE 20 METERS IN LENGTH, 180 DEGREE COLLIMATION

(error bars = 1σ)



Comparison Results

Energy (keV)	ISOCS		MCNP		Ratio (ISOCS/Meas)
	efficiency		efficiency	2σ unc. 1σ rel. unc.	
50	5.96E-06		5.86E-06	9.23E-08 7.88E-03	1.02
100	1.41E-05		1.42E-05	1.41E-07 4.97E-03	1.00
200	1.41E-05		1.44E-05	1.39E-07 4.85E-03	0.98
500	7.76E-06		7.88E-06	1.03E-07 5.55E-03	0.99
1000	4.93E-06		4.94E-06	8.05E-08 8.15E-03	1.00
1500	3.85E-06		3.84E-06	7.11E-08 9.25E-03	1.00
2000	3.17E-06		3.12E-06	6.36E-08 1.02E-02	1.02
2500	2.65E-06		2.60E-06	5.77E-08 1.11E-02	1.02
7000	8.39E-07		8.96E-07	3.43E-08 1.91E-02	0.93
					Mean Relative
					Dataset Ratio Std. Dev.
					<150 keV 1.00 0.01
					>150 keV 0.99 0.02
					All 0.99 0.02

20M LINE SOURCE, 50mm-90d CYLINDRICAL COLLIMATOR

Date: November 6, 2000 ISOCS Version: 4.0

A pipe 0.001 cm in diameter and 20 m in length is used to simulate a line source.

The detector is perpendicular to the pipe and aimed at the center of the pipe.

A collimator with 2 inch thick side shields and an opening angle of 90 degrees is used.

ISOCS Geometry Parameters

Template: PIPE

Detector: 42% (SN 3578)

Collimator: 50mm-90d CRPN=4

1=0.2 2=5.08 3=2.54 4=7.62 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Pipe	0	0.001	1000	1000				
(2) Src 1	0.0005	1000	1000			H	0.0001	1
(3) Src 2								
(4) Absorber 1								
(5) Absorber 2								
(5) Src-Det	100	0	0	0	0			

Air Temp: 0 C Rel. Hum: 0% Bar. Press.: 0 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

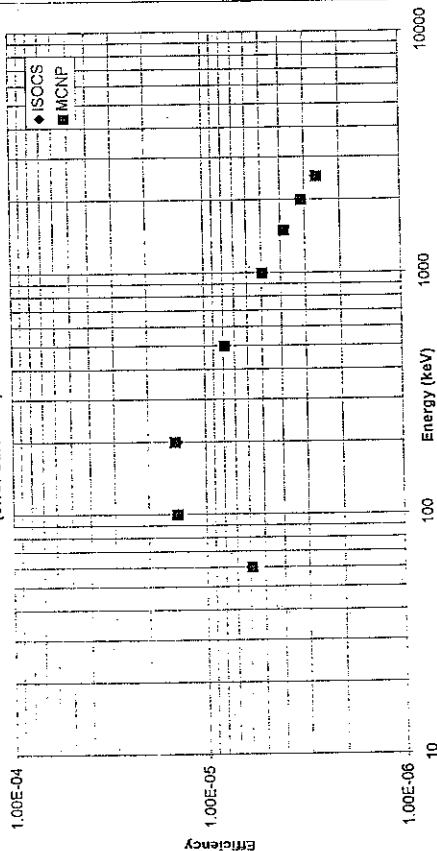
Comparison Results

Energy (keV)	ISOCS efficiency	MCNP			Ratio (ISOCS/Meas)
		efficiency	2 σ unc	1 σ rel. unc	
60	5.98E-06	5.86E-06	9.23E-08	7.88E-03	1.02
100	1.42E-05	1.42E-05	1.41E-07	4.97E-03	1.00
200	1.41E-05	1.44E-05	1.39E-07	4.85E-03	0.98
500	7.78E-06	7.98E-06	1.03E-07	6.55E-03	0.99
1000	4.94E-06	4.94E-06	8.05E-08	8.15E-03	1.00
1500	3.86E-06	3.84E-06	7.11E-08	9.25E-03	1.00
2000	3.17E-06	3.12E-06	6.36E-08	1.02E-02	1.02
2500	2.65E-06	2.60E-06	5.77E-08	1.11E-02	1.02
7000	8.40E-07	8.99E-07	3.43E-08	1.91E-02	0.93

Dataset	Mean		Relative		ISOCS
	Ratio	Std. Dev.	Ratio	Std. Dev.	
<150 keV	1.02	0.03	0.03	0.00	
>150 keV	0.99	0.02	0.02	0.02	
All	1.00	0.01	0.01	0.01	

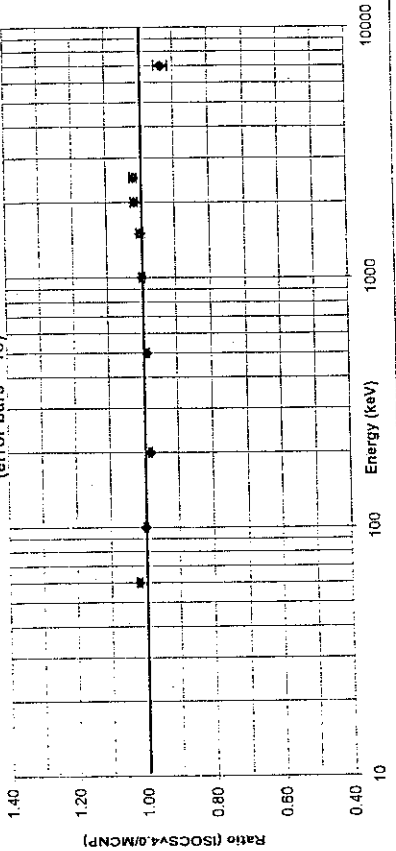
LINE SOURCE 20 METERS IN LENGTH, 90 DEG COLLIMATION

(error bars = 2 σ)



LINE SOURCE 20 METERS IN LENGTH, 90 DEG COLLIMATION

(error bars = 1 σ)



20M LINE SOURCE, 50mm-30D CYLINDRICAL COLLIMATOR

Date: November 6, 2000 ISOCS Version: 4.0

A pipe 0.001 cm in diameter and 20 m in length is used to simulate a line source.
The detector is perpendicular to the pipe and aimed at the center of the pipe.
A collimator with 2 inch thick side shields and an opening angle of 30 degrees is used.

ISOCS Geometry Parameters

Template: PIPE

Detector: 42% (S/N 3578)

Collimator: 50mm-30d CRPN=4

1=0.2, 2=5.08, 3=0.68, 4=2.05, 5=10.16, 6=5.08, 7=15.24, 8=5.08, 9=3.4, mat=Pb, dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Pipe	0	0.001	1000	1000				
(2) Src 1	0.0005	1000				H	0.0001	1
(3) Src 2								
(4) Absorber 1								
(5) Absorber 2								
(5) Src-Det	100	0	0	0	0			

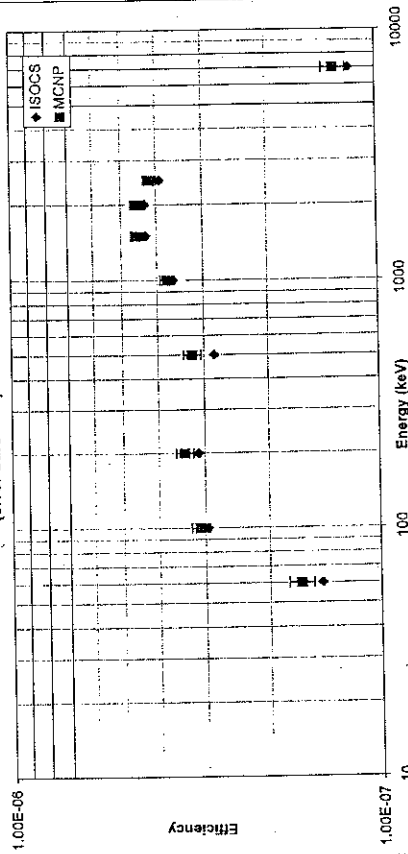
Air: Temp: 0 C Rel. Hum: 0% Bar. Press.: 0 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

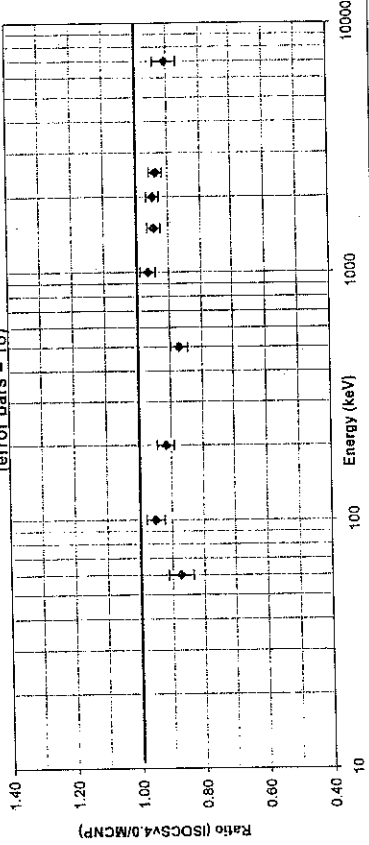
LINE SOURCE 20 METERS IN LENGTH, 30 DEG COLLIMATION

(error bars = 2σ)



LINE SOURCE 20 METERS IN LENGTH, 30 DEG COLLIMATION

(error bars = 1σ)



Comparison Results

Energy (keV)	ISOCS efficiency	MCNP efficiency	2σ unc	1 σ rel. unc	Ratio (ISOCS/Meas)
60	1.44E-07	1.84E-07	1.27E-08	3.66E-02	0.87
100	2.95E-07	3.10E-07	1.72E-08	2.77E-02	0.95
200	3.12E-07	3.41E-07	1.79E-08	2.63E-02	0.92
500	2.82E-07	3.23E-07	1.71E-08	2.65E-02	0.87
1000	3.62E-07	3.75E-07	1.75E-08	2.33E-02	0.95
1500	4.28E-07	4.53E-07	1.82E-08	2.01E-02	0.94
2000	4.30E-07	4.54E-07	1.78E-08	1.96E-02	0.95
2500	3.91E-07	4.17E-07	1.68E-08	2.01E-02	0.94
7000	1.18E-07	1.30E-07	9.50E-09	3.66E-02	0.91
Mean Ratio					0.92
Std Dev					0.06
Dataset <150 keV					0.93
Dataset >150 keV					0.03
All					0.03
ISOCS Std Dev					0.05
ISOCS Std Dev					0.02
ISOCS Std Dev					0.02

20M X 20M PLANE SOURCE, 50mm-180d CYLIND. COLLIMATOR

Date: November 6, 2000 ISOS Version: 4.0

This is rectangular plane source, 0.001 cm thick. The detector is perpendicular to the plane and aimed at the center of the plane. A collimator with a side shield thickness of 2 inches and an opening angle of 180 degrees is present.

ISOS Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (S/N 3578)

Collimator: 50mm-180d CRPN=4

1=0.2 2=3=4=0 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	2000	2000				H	0.0001	1
(2) Src - Lr 1	0.001							
(2...10) Source Layers 2...9 are all empty								
(11) Src - Lr 10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	0	0			

Air: Temp: 0 C Rel. Hum.: 0% Bar. Press.: 0 mm Hg

Convergence: 1%

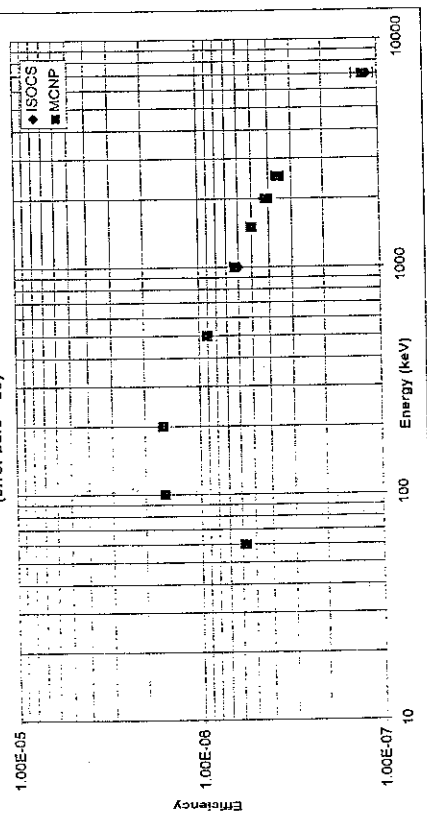
Units: Length: cm Density: g/cc

Comparison Results

Energy (keV)	ISOS efficiency	MCNP efficiency	2 σ unc	1 σ rel. unc	Ratio (ISOS/Meas)
60	5.74E-07	5.80E-07	3.90E-08	3.36E-02	0.99
100	1.58E-06	1.57E-06	6.11E-08	1.95E-02	1.01
200	1.80E-06	1.59E-06	6.09E-08	1.92E-02	1.01
500	8.98E-07	9.08E-07	4.63E-08	2.55E-02	0.99
1000	6.01E-07	6.30E-07	3.68E-08	2.92E-02	0.95
1500	5.01E-07	5.05E-07	3.21E-08	3.18E-02	0.99
2000	4.29E-07	4.13E-07	2.84E-08	3.44E-02	1.04
2500	3.65E-07	3.56E-07	2.63E-08	3.69E-02	1.02
7000	1.15E-07	1.21E-07	1.61E-08	6.64E-02	0.95
Mean					Relative
Dataset					Ratio
<150 keV					1.00
>150 keV					1.00
All					1.00
Std Dev					ISOS
<150 keV					0.01
>150 keV					0.03
All					0.02

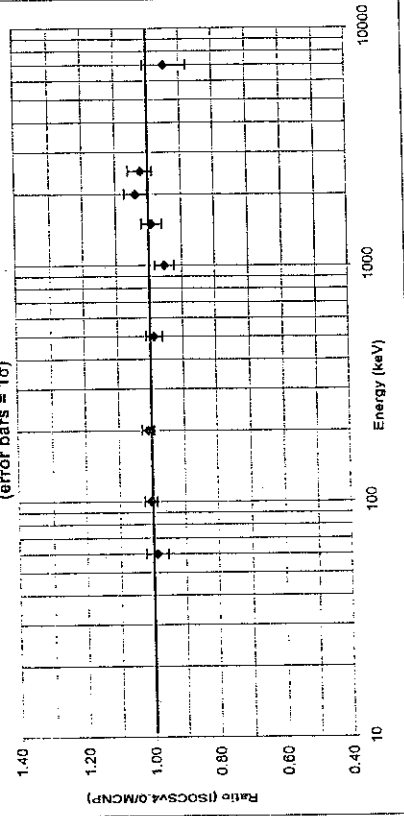
A 20M X 20M PLANE SOURCE, 1M AWAY, 180 DEG. COLLIMATION

(error bars = 2 σ)



A 20M X 20M PLANE SOURCE, 1M AWAY, 180 DEG. COLLIMATION

(error bars = 1 σ)



20M X 20M PLANE SOURCE, 50mm-90D CYLND. COLLIMATOR

Date: November 8, 2000 ISOCS Version: 4.0

This is rectangular plane source, 0.001 cm thick. The detector is perpendicular to the plane and aimed at the center of the plane. A collimator with a side shield thickness of 2 inches and an opening angle of 90 degrees is present.

ISOCS Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (SIN 3578)

Collimator: 50mm-90d CRPN=4

1=0.2 2=3=4=0 5=10.16 6=6.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall		2000	2000					
(2) Src - Lr 1	0.001					H	0.0001	1
(2...10) Source Layers 2...9 are all empty								
(11) Src - Lr 10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	0	0			

Air: Temp: 0 C Rel. Hum.: 0% Bar. Press.: 0 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

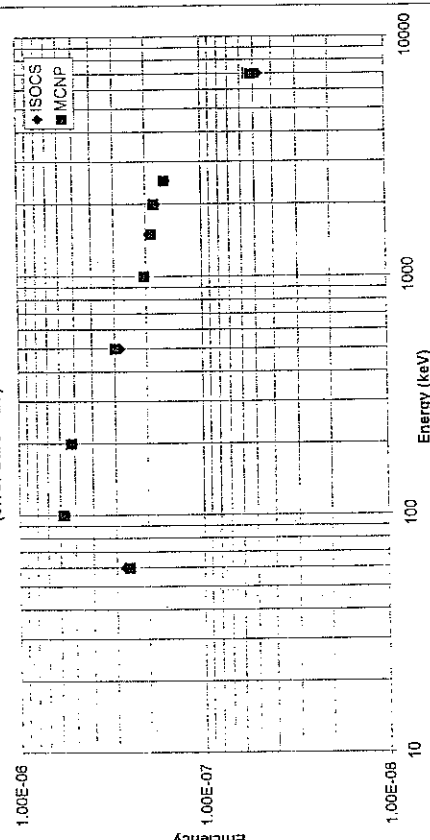
Comparison Results

Energy (keV)	ISOCS efficiency	MCNP efficiency	2 σ unc	1 σ rel. unc	Ratio (ISOCS/Meas)
60	2.70E-07	2.55E-07	1.34E-08	2.62E-02	1.06
100	5.73E-07	5.76E-07	1.96E-08	1.70E-02	1.00
200	5.17E-07	5.21E-07	1.88E-08	1.80E-02	0.99
500	2.82E-07	2.99E-07	1.43E-08	2.40E-02	0.95
1000	2.03E-07	2.05E-07	1.13E-08	2.75E-02	0.99
1500	1.93E-07	1.87E-07	9.86E-09	2.64E-02	1.03
2000	1.78E-07	1.80E-07	9.29E-09	2.58E-02	0.99
2500	1.56E-07	1.58E-07	8.51E-09	2.70E-02	0.99
7000	4.75E-08	5.18E-08	5.10E-09	4.92E-02	0.92

Dataset	Mean Ratio	Relative Std Dev	ISOCS Std Dev
<150 keV	1.01	0.04	0.03
>150 keV	0.98	0.03	0.02
All	0.99	0.03	0.02

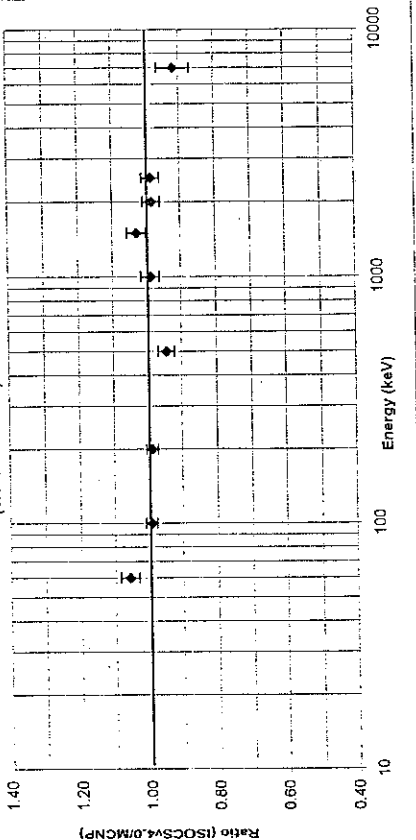
A 20M X 20M PLANE SOURCE, 1M AWAY, 90 DEG. COLLIMATION

(error bars = 2 σ)



A 20M X 20M PLANE SOURCE, 1M AWAY, 90 DEG. COLLIMATION

(error bars = 1 σ)



2M X 2M PLANE SOURCE, 50mm-30D CYLND. COLLIMATOR

Date: November 6, 2000 ISOS Version: 4.0

This is rectangular plane source, 0.001 cm thick. The detector is perpendicular to the plane and aimed at the center of the plane. A collimator with a side shield thickness of 2 inches and an opening angle of 30 degrees is present.

ISOS Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (SIN 3578)

Collimator: 50mm-30d CRPN=4

1=0.2 2=5.08 3=0.68 4=2.05 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall		200	200			H	0.0001	1
(2) Src - Lr 1	0.001							
(2...10) Source Layers 2...9 are all empty								
(11) Src - Lr 10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	0	0			

Air Temp: 0 C Rel. Hum.: 0% Bar. Press.: 0 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

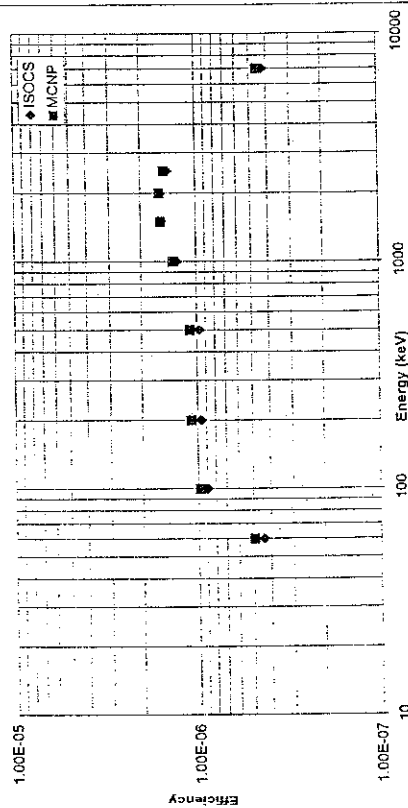
Comparison Results

Energy (keV)	ISOS efficiency	MCNP efficiency	2σ unc	1σ rel. unc	Ratio (ISOS/Meas)
60	4.39E-07	4.94E-07	2.23E-08	2.26E-02	0.89
100	8.98E-07	9.75E-07	3.04E-08	1.56E-02	0.92
200	9.62E-07	1.08E-06	3.18E-08	1.47E-02	0.89
500	9.69E-07	1.09E-06	3.14E-08	1.44E-02	0.89
1000	1.28E-06	1.33E-06	3.38E-08	1.27E-02	0.96
1500	1.53E-06	1.55E-06	3.54E-08	1.14E-02	0.99
2000	1.56E-06	1.57E-06	3.50E-08	1.11E-02	0.99
2500	1.42E-06	1.48E-06	3.34E-08	1.13E-02	0.96
7000	4.22E-07	4.55E-07	1.87E-08	2.06E-02	0.93

Dataset	Mean Ratio	Relative Std Dev	ISOS Std Dev
<200 keV	0.91	0.02	0.02
>200 keV	0.94	0.04	0.04
All	0.93	0.04	0.04

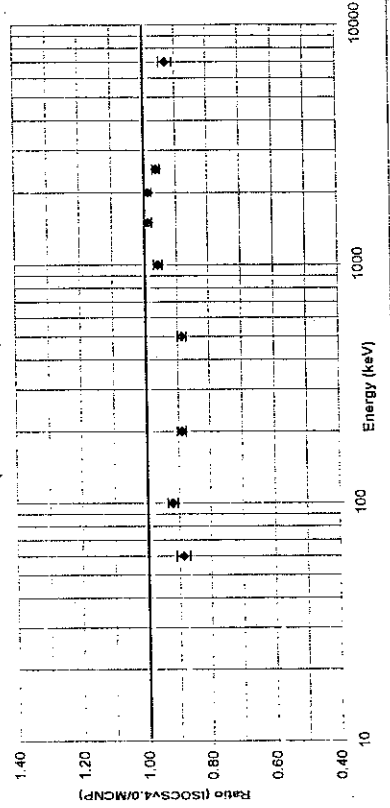
A 2M X 2M PLANE SOURCE, 1M AWAY, 30 DEG. COLLIMATION

(error bars = 2σ)



A 2M X 2M PLANE SOURCE, 1M AWAY, 30 DEG. COLLIMATION

(error bars = 1σ)



20M LINE SOURCE, 50mm-1800 RECT. COLLIMATOR
Date: November 6, 2000
ISOCS Version: 4.0

A pipe 0.001 cm in diameter and 20 m in length is used to simulate a line source.
The detector is perpendicular to the pipe and aimed at the center of the pipe.
A collimator with 2 inch thick side shields and an opening angle of 180 degrees is used.

ISOCS Geometry Parameters

Template: Pipe

Detector: 42% (S/N 3578)

Collimator: R50mm-180d CRPN=4

1=0.2 2=3=4=0 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Pipe	0	0.001	1000	1000		H	0.0001	1
(2) Src 1	0.0005	1000	1000					
(3) Src 2								
(4) Absorber 1								
(5) Absorber 2								
(5) Src-Det	100	0	0	0	0			

Air Temp: 0 C Rel Hum: 0% Bar. Press: 0 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

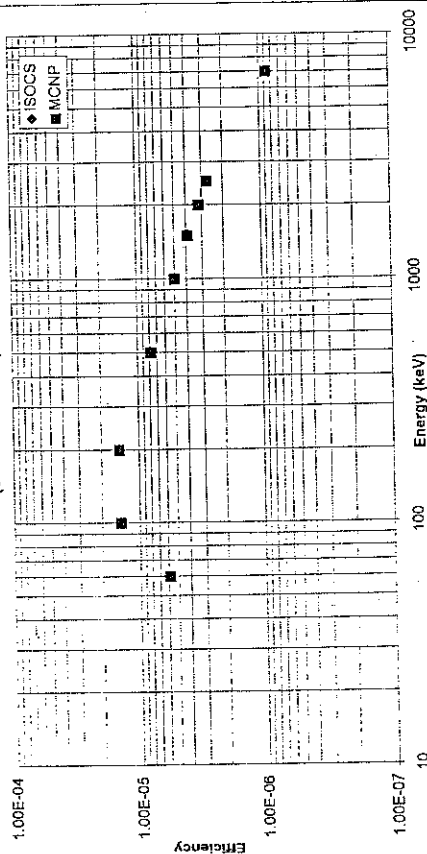
Comparison Results

Energy (keV)	ISOCS		MCNP		Ratio	
	efficiency	2 σ unc	efficiency	1 σ rel. unc	(ISOCS/Meas)	
60	6.03E-06		5.86E-06	5.60E-03	1.03	
100	1.44E-05		1.41E-05	3.45E-03	1.02	
200	1.44E-05		1.44E-05	3.43E-03	1.00	
500	7.93E-06		7.83E-06	4.63E-03	1.01	
1000	5.02E-06		4.99E-06	5.74E-03	1.01	
1500	3.92E-06		3.89E-06	6.43E-03	1.01	
2000	3.22E-06		3.15E-06	7.13E-03	1.02	
2500	2.69E-06		2.68E-06	7.70E-03	1.01	
7000	8.53E-07		8.76E-07	1.36E-02	0.97	

Dataset	Mean		ISOCS	
	Ratio	Std Dev	Ratio	Std Dev
<150 keV	1.02	0.01	0.01	0.01
>150 keV	1.01	0.01	0.01	0.01
All	1.01	0.01	0.01	0.01

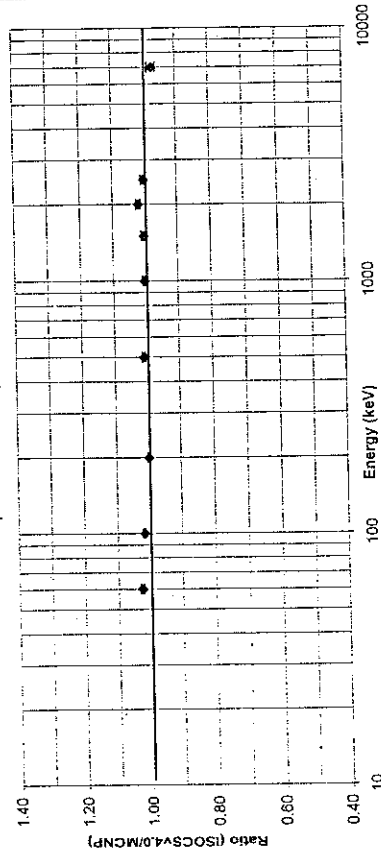
LINE SOURCE 20 METERS IN LENGTH, 180 DEG COLLIMATION

(error bars = 2 σ)



LINE SOURCE 20 METERS IN LENGTH, 180 DEGREE COLLIMATION

(error bars = 1 σ)



20M LINE SOURCE, 50mm-90D RECT. COLLIMATOR

Date: November 6, 2000 ISOCS Version: 4.0

A long box 2000cm X 0.05cm X 0.05 cm is used to simulate a line source.
The detector is perpendicular to the source and aimed at the source center.
A 50mm-90 deg rectangular collimator is used.

ISOCS Geometry Parameters

Template: Simple Box

Detector: 42% (S/N 3578)

Collimator: R50mm-90d CRPN=4

1=0.2 2=3=4=0 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Box	0	2000	0.1	0.1				
(2) Top layer								
(3) Bottom la	0.1					DRYAIR	1.00E-05	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	100	0	0	0	0			

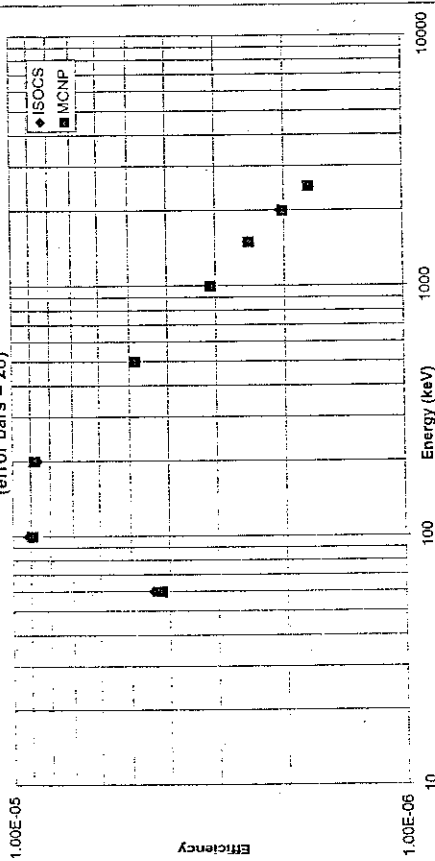
Air: Temp: 0 C Rel. Hum.: 0% Bar. Press.: 0 mm Hg

Convergence: 1%

Units: Length: cm Density: g/cc

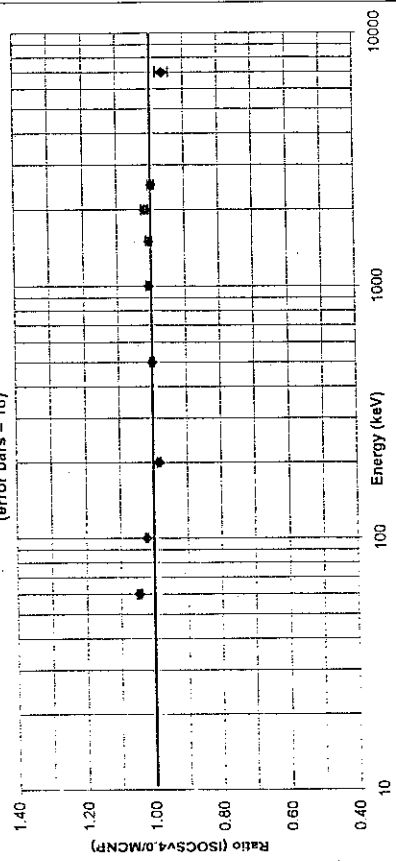
LINE SOURCE 20 METERS IN LENGTH, 90 DEG COLLIMATION

(error bars = 2σ)



LINE SOURCE 20 METERS IN LENGTH, 90 DEGREE COLLIMATION

(error bars = 1σ)



Comparison Results

Energy (keV)	ISOCS efficiency	MCNP 2σ unc	1 σ rel. unc	Ratio (ISOCS/Meas)
60	4.39E-06	4.19E-06	5.87E-08	7.00E-03
100	9.13E-06	8.92E-06	8.32E-08	4.88E-03
200	8.64E-06	8.79E-06	8.33E-08	4.74E-03
500	4.84E-06	4.84E-06	6.24E-08	6.45E-03
1000	3.13E-06	3.10E-06	4.93E-08	7.96E-03
1500	2.48E-06	2.46E-06	4.36E-08	8.86E-03
2000	2.06E-06	2.02E-06	3.93E-08	9.74E-03
2500	1.72E-06	1.72E-06	3.62E-08	1.05E-02
7000	5.42E-07	5.63E-07	2.07E-08	1.84E-02
Mean				0.96
Dataset				Ratio
<150 keV				1.03
>150 keV				0.99
All				1.01
Std Dev				0.02
ISOCS				0.01
Std Dev				0.02

2M LINE SOURCE, 50mm-30D RECT. COLLIMATOR Date: November 6, 2000 ISOCS Version: 4.0

A pipe 0.001 cm in diameter and 2 m in length is used to simulate a line source.
The detector is perpendicular to the pipe and aimed at the center of the pipe.
A collimator with 2 inch thick side shields and an opening angle of 30 degrees is used.

ISOCS Geometry Parameters

Template: Pipe

Detector: 42% (SN 3578)

Collimator: R 50mm-30d CRPN=4

1=0.2 2=5.08 3=0.68 4=2.05 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Pipe	0	0.001	100	100		H	0.0001	1
(2) Src 1	0.0005	100						
(3) Src 2								
(4) Absorber 1								
(5) Absorber 2								
(5) Src-Det	100	0	0	0	0			

Air: Temp: 0 C Rel. Hum.: 0% Bar. Press.: 0 mm Hg

Convergence: 1%

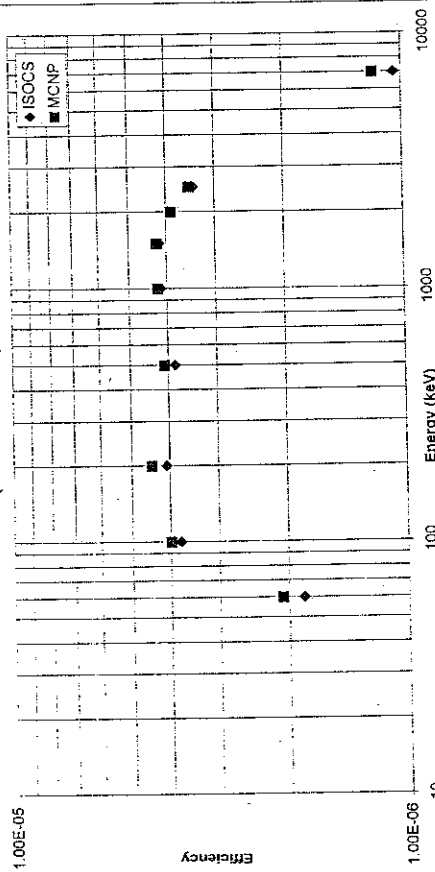
Units: Length: cm Density: g/cc

Comparison Results

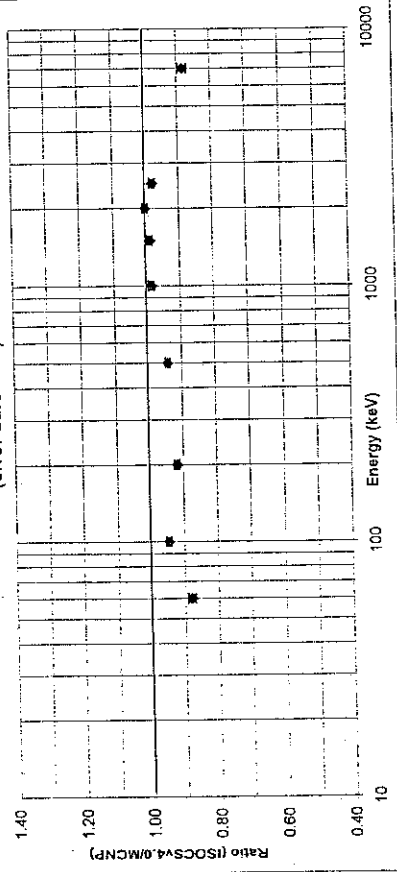
Energy (keV)	ISOCS efficiency	MCNP efficiency	2 σ unc	1 σ rel. unc	Ratio (ISOCS/Meas)
60	1.83E-06	2.08E-06	4.49E-08	1.08E-02	0.88
100	3.77E-06	3.98E-06	6.09E-08	7.65E-03	0.95
200	4.08E-06	4.45E-06	6.43E-08	7.23E-03	0.92
500	3.84E-06	4.08E-06	6.12E-08	7.50E-03	0.94
1000	4.16E-06	4.22E-06	6.17E-08	7.31E-03	0.99
1500	4.18E-06	4.23E-06	6.08E-08	7.18E-03	0.99
2000	3.89E-06	3.88E-06	5.78E-08	7.44E-03	1.00
2500	3.41E-06	3.49E-06	5.45E-08	7.81E-03	0.98
7000	1.04E-06	1.18E-06	3.19E-08	1.35E-02	0.88

Mean	Relative	ISOCS
Ratio	Std Dev	Std Dev
Dataset		
<150 keV	0.92	0.05
>150 keV	0.95	0.04
All	0.94	0.05

LINE SOURCE 2 METERS IN LENGTH, 30 DEG COLLIMATION (error bars = 2 σ)



LINE SOURCE 2 METERS IN LENGTH, 30 DEG COLLIMATION (error bars = 1 σ)



20M X 20M PLANE SOURCE, 50mm-180d RECT. COLLIMATOR

Date: November 6, 2000 ISOCS Version: 4.0

This is rectangular plane source, 0.001 cm thick. The detector is perpendicular to the plane and aimed at the center of the plane. A rect. collimator with a side shield thickness of 2 inches and an opening angle of 180 degrees is present.

ISOCS Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (SIN 3578)

Collimator: R50mm-180d CRPN=4

1-0.2 2-3=4=0 5-10.16 6-5.08 7-15.24 8-5.08 9-3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall		2000	2000					
(2) Src - Lr 1	0.001					H	0.0001	1
(2...10) Source Layers 2...9 are all empty								
(11) Src - Lr 10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	0	0			

Air. Temp: 0 C Rel. Hum.: 0% Bar. Press.: 0 mm Hg

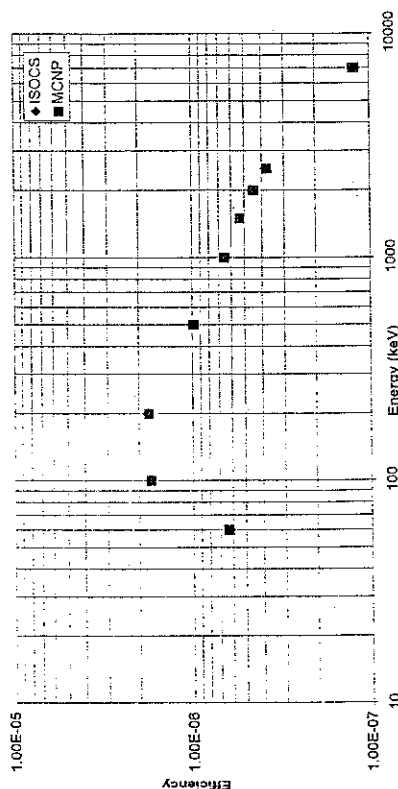
Convergence: 1%

Units: Length: cm Density: g/cc

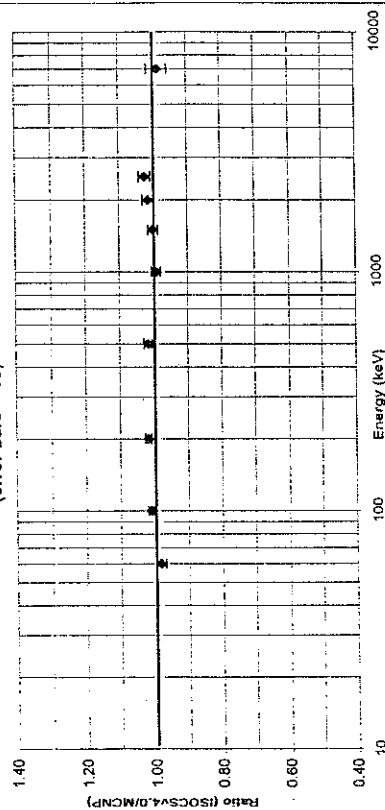
Comparison Results

Energy (keV)	ISOCS efficiency	MCNP efficiency	2 σ unc	1 σ rel. unc	Ratio (ISOCS/Meas)
60	6.25E-07	6.33E-07	1.80E-08	1.42E-02	0.99
100	1.74E-06	1.72E-06	2.83E-08	8.23E-03	1.01
200	1.79E-06	1.76E-06	2.80E-08	7.98E-03	1.02
500	9.99E-07	9.81E-07	2.10E-08	1.07E-02	1.02
1000	6.54E-07	6.57E-07	1.67E-08	1.27E-02	1.00
1500	5.35E-07	5.33E-07	1.47E-08	1.38E-02	1.00
2000	4.53E-07	4.48E-07	1.33E-08	1.49E-02	1.02
2500	3.84E-07	3.75E-07	1.21E-08	1.61E-02	1.03
7000	1.21E-07	1.22E-07	7.07E-09	2.89E-02	0.99
Mean					Relative
Dataset					Ratio
<150 keV					Std Dev
>150 keV					Std Dev
All					Std Dev

A 20M X 20M PLANE SOURCE, 1M AWAY, 180 DEG. COLLIMATION

(error bars = 2 σ)

A 20M X 20M PLANE SOURCE, 1M AWAY, 180 DEG. COLLIMATION

(error bars = 1 σ)

20M X 20M PLANE SOURCE, 50mm-90d RECT. COLLIMATOR

Date: November 6, 2000

ISOS Version: 4.0

This is rectangular plane source, 0.001 cm thick. The detector is perpendicular to the plane and aimed at the center of the plane. A collimator with a side shield thickness of 2 inches and an opening angle of 90 degrees is present.

ISOS Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (SN 3578)

Collimator: R50mm-90d CRPN=4

1=0.2 2=5.08 3=2.54 4=7.62 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 Mat=Pb Dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall		2000	2000			H	0.0001	1
(2) Src - Lr 1	0.001							
(2...10) Source Layers 2...9 are all empty								
(11) Src - Lr 10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	0	0			

Air: Temp: 0 C Rel. Hum.: 0% Bar. Press.: 0 mm Hg

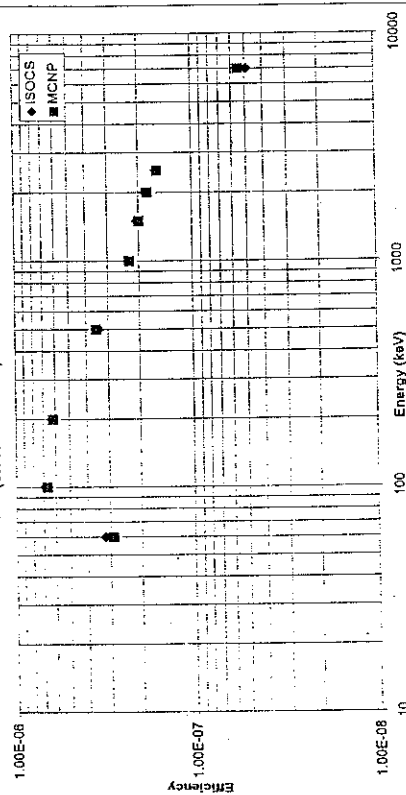
Convergence: 1%

Units: Length: cm Density: g/cc

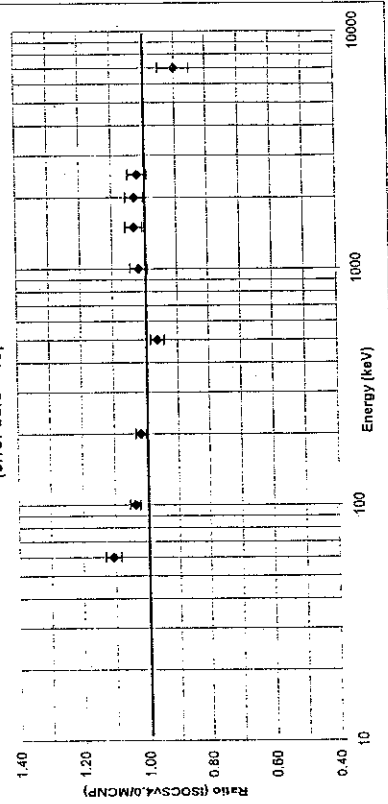
Comparison Results

Energy (keV)	ISOS efficiency	MCNP 2 σ unc	1 σ rel. unc	Ratio (ISOS/Meas)
60	3.22E-07	2.90E-07	1.41E-08	2.43E-02
100	6.94E-07	6.68E-07	2.07E-08	1.55E-02
200	6.27E-07	6.16E-07	2.01E-08	1.63E-02
500	3.39E-07	3.52E-07	1.53E-08	2.18E-02
1000	2.31E-07	2.27E-07	1.20E-08	2.64E-02
1500	2.05E-07	1.99E-07	1.05E-08	2.65E-02
2000	1.84E-07	1.79E-07	9.58E-09	2.68E-02
2500	1.60E-07	1.57E-07	8.86E-09	2.83E-02
7000	4.91E-08	5.45E-08	5.39E-09	4.95E-02
Mean				Relative
Dataset				Ratio
<150 keV				1.06
>150 keV				1.00
All				1.02
Std Dev				ISOS
<150 keV				0.04
>150 keV				0.03
All				0.04

A 20M X 20M PLANE SOURCE, 1M AWAY, 90 DEG. COLLIMATION

(error bars = 2 σ)

A 20M X 20M PLANE SOURCE, 1M AWAY, 90 DEG. COLLIMATION

(error bars = 1 σ)

2M X 2M PLANE SOURCE, 50mm-30d RECT. COLLIMATOR

Date: November 6, 2000 ISOCs Version: 4.0

This is rectangular plane source, 0.001 cm thick. The detector is perpendicular to the plane and aimed at the center of the plane. A collimator with a side shield thickness of 2 inches and an opening angle of 30 degrees is present.

ISOCs Geometry Parameters

Template: RECTANGULAR PLANE

Detector: 42% (SN 3578)

Collimator: R50mm-30d CRPN=4

1=0.2 2=5.08 3=0.68 4=2.05 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall		200	200			H	0.0001	1
(2) Src - Lr 1	0.001							
(2...10) Source Layers 2...9 are all empty								
(11) Src - Lr 10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	0	0			

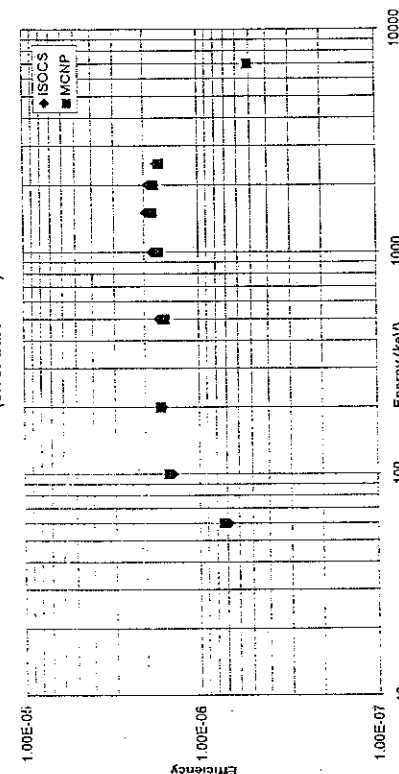
Air: Temp: 0 C Rel. Hum.: 0% Bar. Press.: 0 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

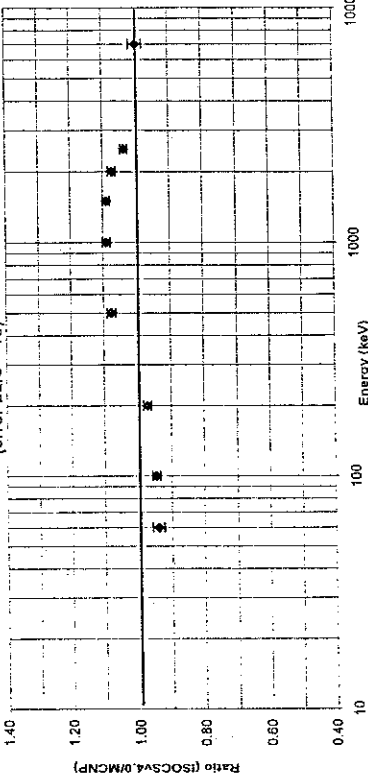
A 2M X 2M PLANE SOURCE, 1M AWAY, 30 DEG. COLLIMATION

(error bars = 2σ)



A 2M X 2M PLANE SOURCE, 1M AWAY, 30 DEG. COLLIMATION

(error bars = 1σ)



Comparison Results

Energy (keV)	ISOCs efficiency	MCNP efficiency	2σ unc	1 σ rel. unc	Ratio (ISOCs/Meas)
60	6.90E-07	7.32E-07	2.65E-08	1.81E-02	0.94
100	1.41E-06	1.48E-06	3.66E-08	1.23E-02	0.95
200	1.60E-06	1.65E-06	3.85E-08	1.17E-02	0.97
500	1.68E-06	1.56E-06	3.70E-08	1.19E-02	1.08
1000	1.83E-06	1.68E-06	3.76E-08	1.12E-02	1.09
1500	1.97E-06	1.80E-06	3.79E-08	1.05E-02	1.09
2000	1.90E-06	1.77E-06	3.72E-08	1.05E-02	1.07
2500	1.71E-06	1.66E-06	3.56E-08	1.08E-02	1.04
7000	5.12E-07	5.11E-07	1.99E-08	1.95E-02	1.00
					Mean
					Ratio
					Std Dev
					Std Dev
					ISOCs
					Dataset
					<150 keV
					0.95
					0.00
					0.01
					>150 keV
					1.06
					0.04
					0.04
					All
					1.03
					0.06
					0.06

4 CU.M BOX OF DIRT AT 1M, DENS=0.3, 180d COLLIMATOR

Date: November 6, 2000 ISOCS Version: 4.0

This is a box 224 x 137 x 137cm full of dirt. The container was 0.16cm of iron. The front face of the box is 1 m from the detector. The detector points at the center of the box. The source data comes from MCNP (lb_geom7.eff), as was used on the Mound project for Special Services Division. The dirt composition is O60_Si12_C8_Ca8_H5_A14_Mg2. Density is 0.3 g/cc. The detector was a 40% from SSD, and had a collimator 8.9cm ID, 2.54 thick, and 0.708 extension past endcap.

ISOCS Geometry Parameters

Template: SIMPLE BOX

Detector: LBooth

Collimator: Special, CRPN=4

1=0.708, 2=3=4=0, 5=6.99, 6=2.54, 7=16.5, 8=9=0, material=Pb, density=11.36

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Comp.
(1) Containe	0.16	224	137	136.84		FE	7.86	
(2) Src - Top								
(3) Src - Botl	137					Moundirt	0.3	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	100	0	0	0	0			

Air: Temp: 20 C Rel Hum.: 0% Bar. Press.: 760 mm Hg

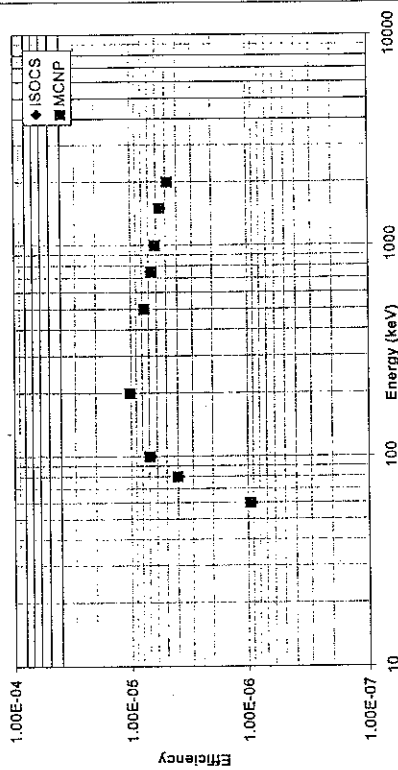
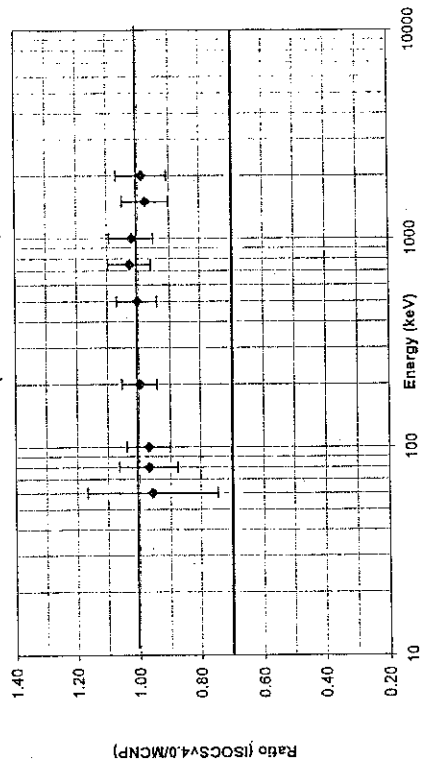
Convergence: 0.1%

Units: Length: cm Density: g/cc

Comparison Results

Energy (keV)	ISOCS efficiency	MCNP efficiency	2 σ rel. uncert.	Ratio (ISOCS/MCNP)
60	9.23E-07	9.63E-07	2.09E-01	0.96
80	3.93E-06	4.05E-06	9.48E-02	0.97
100	6.76E-06	6.97E-06	7.04E-02	0.97
200	1.03E-05	1.03E-05	5.64E-02	1.00
500	7.72E-06	7.68E-06	6.50E-02	1.01
750	6.82E-06	6.63E-06	6.94E-02	1.03
1000	6.29E-06	6.16E-06	7.14E-02	1.02
1500	5.50E-06	5.63E-06	7.46E-02	0.98
2000	4.77E-06	4.83E-06	8.04E-02	0.99
				Mean
				Relative
				Std Dev
				ISOCS
				Std Dev
				Ratio
				0.97
				0.00
				Dataset
				<150 keV
				1.00
				>150 keV
				0.02
				All
				1.00
				0.02
				0.01
				0.02

4 CUBIC METER BOX OF DIRT AT 1M, DENS=0.3, W/COLLIMATOR

4 CUBIC METER BOX OF DIRT AT 1M, DENS=0.3, W/COLLIMATOR (error bars = 2 σ)

4 CU.M BOX OF DIRT AT 1M, DENS=0.7, 180d COLLIMATOR

Date: November 6, 2000 ISOCS Version: 4.0

This is a box 224 x 137 x 137cm full of dirt. The container was 0.16cm of iron.
 The front face of the box is 1 m from the detector. The detector points at the center of the box.
 The source data comes from MCNP, as was used on the Mound project for Special Services Division.
 The dirt composition is O60_Si12_C9_Ca8_H5_A14_Mg2. Density is 0.7g/cc.
 The detector was a 40% from SSD, and had a collimator 8.9cm ID, 2.54 thick, and 0.708 extension past endcap

ISOCS Geometry Parameters

Template: SIMPLE BOX

Detector: LBooth

Collimator: Special, CRPN=4

1=0.708, 2=3=4=0, 5=6.99, 6=2.54, 7=16.5, 8=9=0, material=Pb, density=11.36

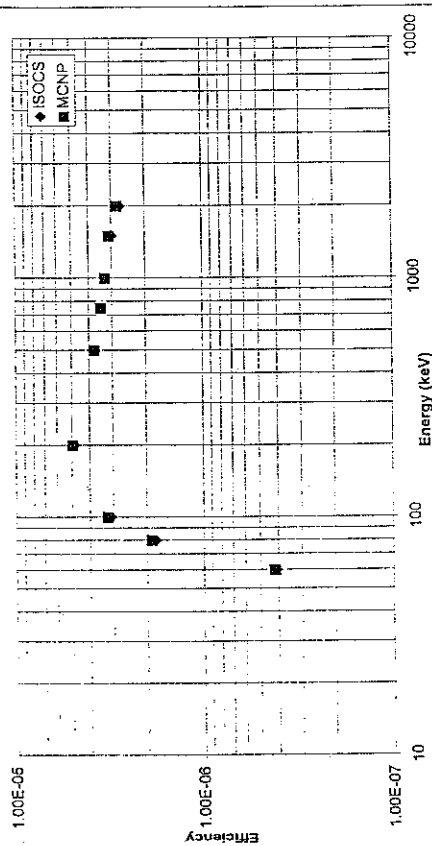
Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.16	224	137	136.84		FE	7.86	
(2) Src - Top								
(3) Src - Bott	137					Moundit	0.7	1
(4) Absorber 1								
(5) Absorber 2								
(6) Src-Det	100	0	0	0	0			

Air: Temp: 20 C Rel. Hum.: 0% Bar. Press.: 760 mm Hg

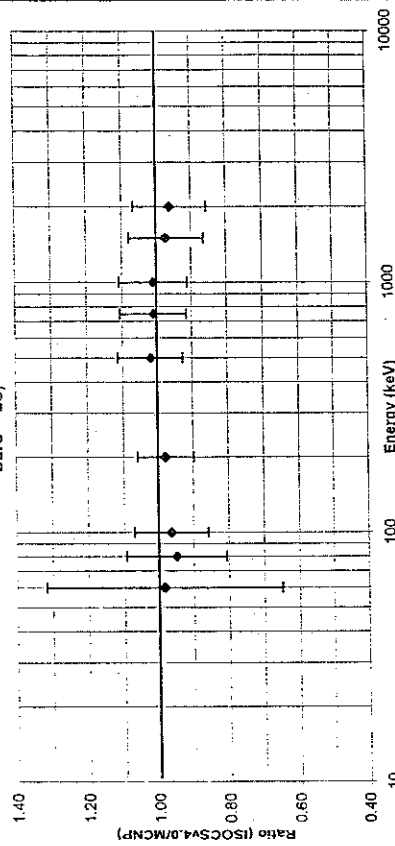
Convergence: 0.1%

Units: Length: cm Density: g/cc

4 CUBIC METER BOX OF DIRT AT 1M, DENS=0.7, W/COLLIMATOR



4 CUBIC METER BOX OF DIRT AT 1M, DENS=0.7, W/COLLIMATOR (error bars = 2σ)



Comparison Results

Energy (keV)	ISOCS efficiency	MCNP efficiency	2σ rel. uncert.	Ratio (ISOCS/MCNP)
60	4.10E-07	4.17E-07	3.34E-01	0.98
80	1.79E-06	1.88E-06	1.43E-01	0.95
100	3.11E-06	3.23E-06	1.06E-01	0.96
200	4.84E-06	4.95E-06	8.18E-02	0.98
500	3.81E-06	3.74E-06	9.36E-02	1.02
750	3.47E-06	3.44E-06	9.58E-02	1.01
1000	3.29E-06	3.26E-06	9.82E-02	1.01
1500	3.02E-06	3.10E-06	1.08E-01	0.97
2000	2.72E-06	2.82E-06	1.05E-01	0.96
Mean Relative Ratio				
Dataset	Ratio	Std Dev	ISOCS Std Dev	
<150 keV	0.96	0.01	0.02	
>150 keV	0.99	0.02	0.02	
All	0.99	0.03	0.02	

2.5 CU-M BOX OF DIRT AT 1M, DENS=1.3, 180d COLLIMATOR
Date: November 6, 2000
ISOCS Version: 4.0

This is a box 175 x 137 x 99cm full of dirt. The container was 0.16cm of iron.
The front face of the box is 1 m from the detector. The detector points at the center of the box.
The source data comes from MCNP, as was used on the Mound project for Special Services Division.
The dirt composition is O60_Si12_C9_Ca8_H5_Al4_Mg2.
The detector was a 40% from SSD, and had a collimator 8.9cm ID, 2.54 thick, and 0.708 extension past endcap.

ISOCS Geometry Parameters

Template: SIMPLE BOX

Detector: LBooth

Collimator: Special, CRPN=4

1=0.708, 2=3=4=0, 5=6.99, 6=2.54, 7=16.5, 8=9=0, material=Pb, density=11.36

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
------	-----	-----	-----	-----	-----	----------	---------	-------

(1) Container 0.16 175 137 99 FE 7.86

(2) Src - Top 137 Moundirt 1.3 1

(3) Src - Bott 137

(4) Absorber 1

(5) Absorber 2

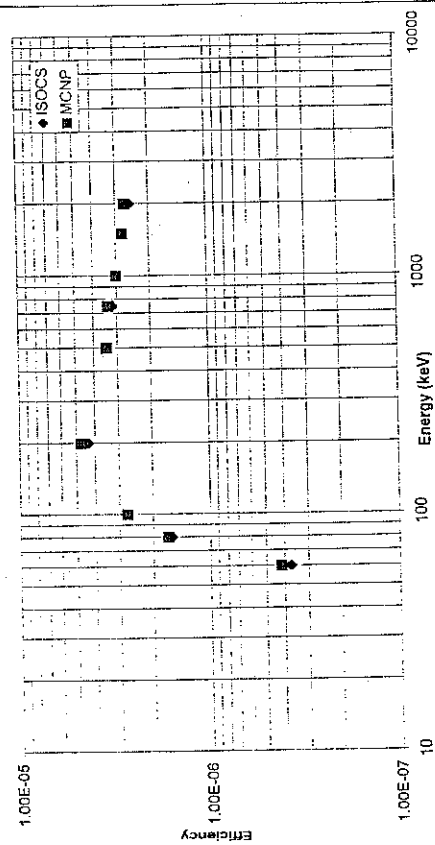
(6) Src-Det 100 0 0 0 0

Air: Temp: 20 C Rel. Hum.: 0% Bar. Press.: 760 mm Hg

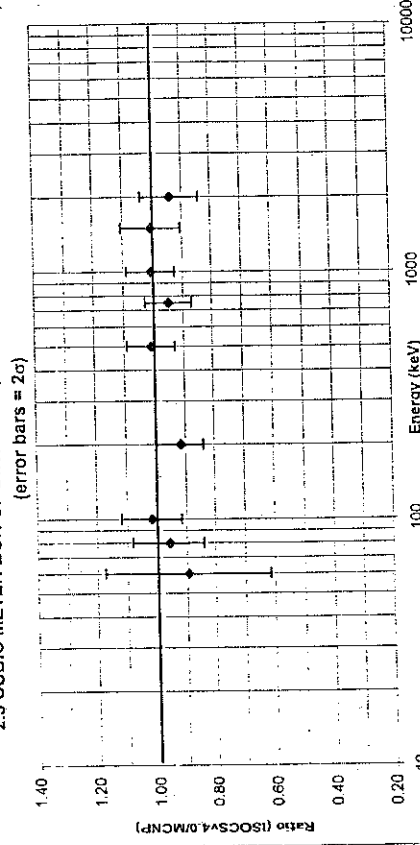
Convergence: 0.1%

Units: Length: cm Density: g/cc

2.5 CUBIC METER BOX OF DIRT AT 1M, DENS=1.3, W/COLLIMATOR



2.5 CUBIC METER BOX OF DIRT AT 1M, DENS=1.3, W/COLLIMATOR



Comparison Results		MCNP		Ratio	
Energy (keV)	ISOCS efficiency	efficiency	2s rel. uncert.	(ISOCS/MCNP)	
60	3.73E-07	4.16E-07	2.80E-01	0.90	
80	1.60E-06	1.67E-06	1.20E-01	0.96	
100	2.78E-06	2.73E-06	1.00E-01	1.02	
200	4.34E-06	4.74E-06	8.00E-02	0.92	
500	3.46E-06	3.42E-06	8.00E-02	1.01	
750	3.17E-06	3.33E-06	8.00E-02	0.95	
1000	3.02E-06	2.99E-06	8.00E-02	1.01	
1500	2.78E-06	2.76E-06	1.00E-01	1.01	
2000	2.52E-06	2.68E-06	1.00E-01	0.94	
				Mean Ratio	Relative Std Dev
				0.98	0.06
				Dataset	Std Dev
				<150 keV	0.02
				>150 keV	0.04
				All	0.04

LINE SOURCE MEASUREMENTS, 50mm-180d COLLIMATOR

Date: November 6, 2000

ISOCS Version: 4.0

Six standard line sources, each 81.3 cm in length and 0.953 cm in diameter were taped end-to-end to form a single long source. The radioactivity in the standard sources is distributed in an epoxy matrix of density 1.07 g/cc.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (SIN 3578)

Collimator: 50mm-180d CRPN=4

1=0.2 2=3=4=0 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.089	0.775	485.4			Al	2.7	
(2) Top Layer						Epoxy	1.07	1
(3) Bot Layer		485.4						
(4) Absorber 1								
(5) Absorber 2								
(5) Src-Det	97.5	0	1.2	0	1.2			

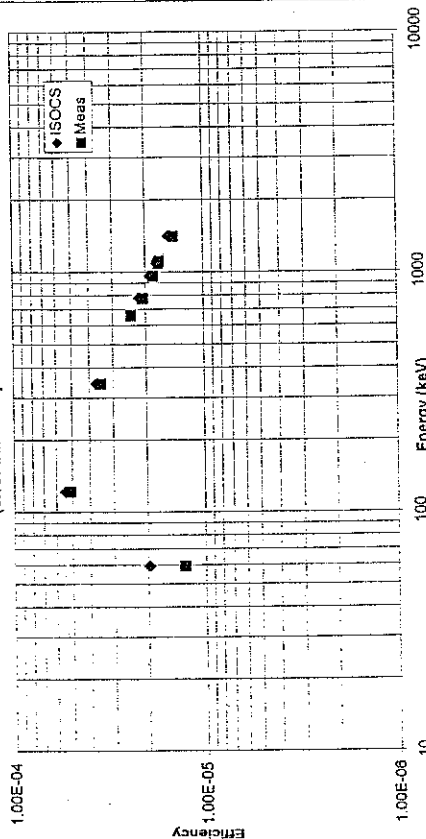
Air: Temp: 20 C Rel Hum: 50% Bar. Press: 760 mm Hg

Convergence: 0.1%

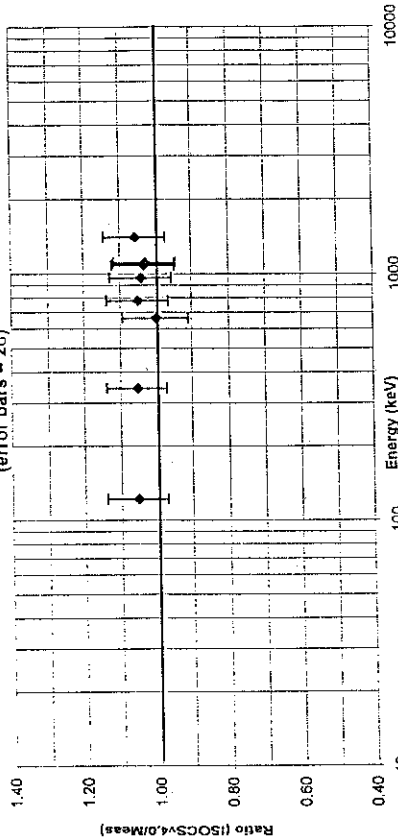
Units: Length: cm Density: g/cc

Source material: 72.1%C+21.9%O+6%H

LINE SOURCE 20 METERS IN LENGTH, 30 DEG COLLIMATION

(error bars = 1 σ)

LINE SOURCE MEASUREMENTS, 180 DEG COLLIMATION

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCS efficiency	Measurements			Ratio (ISOCS/Meas)
		efficiency	1 σ unc.	2s rel.unc.	
59.54	1.97E-05	1.28E-05	5.26E-07	8.22E-02	1.54
121.78	5.40E-05	5.12E-05	2.16E-06	8.44E-02	1.06
344.29	3.68E-05	3.49E-05	1.47E-06	8.42E-02	1.06
661.66	2.40E-05	2.39E-05	1.09E-06	9.12E-02	1.00
778.92	2.18E-05	2.07E-05	8.94E-07	8.64E-02	1.05
964.11	1.91E-05	1.83E-05	7.94E-07	8.68E-02	1.04
1085.89	1.77E-05	1.71E-05	7.55E-07	8.83E-02	1.03
1112.08	1.74E-05	1.69E-05	7.30E-07	8.64E-02	1.03
1408	1.51E-05	1.49E-05	6.11E-07	8.55E-02	1.06
Mean					Ratio
Dataset					Std. Dev.
<150 keV					0.26
>150 keV					0.02
All					0.12
					0.11

LINE SOURCE MEASUREMENTS, 50mm-90d COLLIMATOR

Date: November 6, 2000

ISOCS Version: 4.0

Six standard line sources, each 81.3 cm in length and 0.953 cm in diameter were taped end-to-end to form a single long source. The radioactivity in the standard sources is distributed in an epoxy matrix of density 1.07 g/cc.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (S/N 3578)

Collimator: 50mm-90d CRPN=4

1=0.2 2=5.08 3=2.54 4=7.62 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.089	0.775	485.4			Al	2.7	
(2) Top Layer								
(3) Bot Layer	485.4					Epoxy	1.07	1
(4) Absorber 1								
(5) Absorber 2								
(5) Src-Det	97.5	0	1.2	0	1.2			

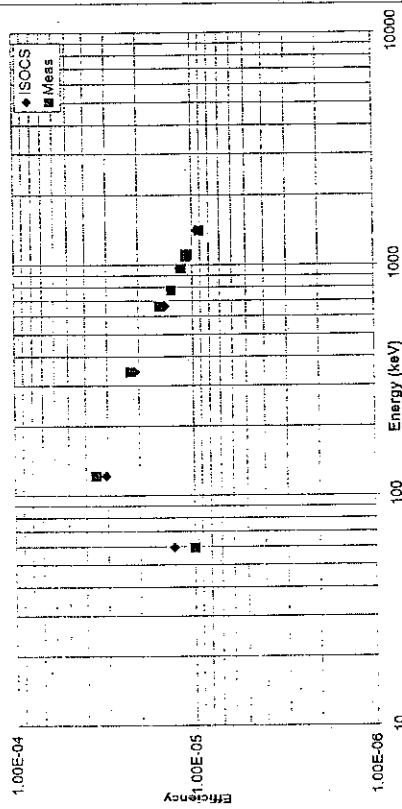
Air: Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

Convergence: 0.1%

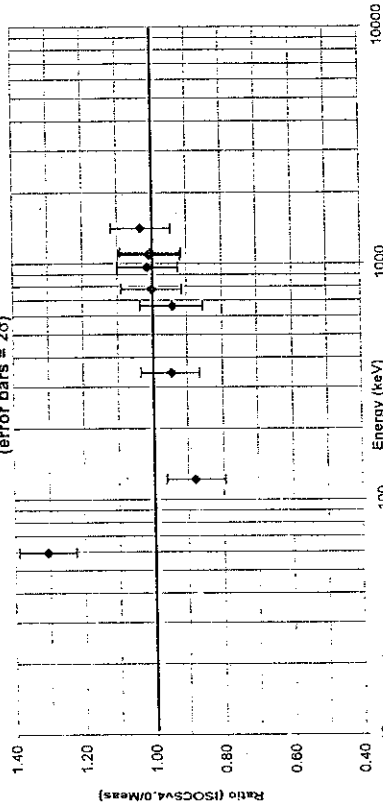
Units: Length: cm Density: g/cc

Source material: 72.1%⁶⁰Co+21.9%¹³⁷Cs+6%¹⁵²Eu

LINE SOURCE MEASUREMENTS, 90 DEG COLLIMATION

(error bars = 1 σ)

LINE SOURCE MEASUREMENTS, 90 DEG COLLIMATION

(error bars = 2 σ)

Comparison Results

Energy (keV)	ISOCS efficiency	Measurements efficiency	1 σ unc	2 σ rel. unc.	Ratio (ISOCS/Meas)
59.54	1.30E-05	9.96E-06	4.08E-07	8.19E-02	1.31
121.78	3.08E-05	3.50E-05	1.48E-06	8.46E-02	0.88
344.29	2.11E-05	2.23E-05	9.42E-07	8.45E-02	0.95
661.66	1.44E-05	1.52E-05	6.92E-07	9.11E-02	0.94
778.92	1.31E-05	1.31E-05	5.66E-07	8.64E-02	1.00
964.11	1.17E-05	1.15E-05	4.97E-07	8.64E-02	1.01
1085.89	1.09E-05	1.08E-05	4.78E-07	8.85E-02	1.01
1112.08	1.08E-05	1.07E-05	4.65E-07	8.69E-02	1.00
1408	9.40E-06	9.11E-06	3.89E-07	8.54E-02	1.03
Mean					Relative
Dataset					Ratio
<150 keV					1.02
>150 keV					0.99
All					1.00
Std Dev					0.27
ISOCS					0.03
Std Dev					0.11
All					0.10

LINE SOURCE MEASUREMENTS, 50mm-30d COLLIMATOR

Date: November 6, 2000

ISOCS Version: 4.0

Six standard line sources, each 81.3 cm in length and 0.953 cm in diameter were taped end-to-end to form a single long source. The radioactivity in the standard sources is distributed in an epoxy matrix of density 1.07 g/cc.

ISOCS Geometry Parameters

Template: SIMPLE CYLINDER

Detector: 42% (S/N 3578)

Collimator: 50mm-30d CRPN=4

1=0.2 2=5.08 3=0.68 4=2.05 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Container	0.089	0.775	485.4			Al	2.7	
(2) Top Layer								
(3) Bot Layer	485.4					Epoxy	1.07	1
(4) Absorber 1								
(5) Absorber 2								
(5) Src-Det	97.5	0	1.2	0	1.2			

Air Temp: 20 C Rel. Hum.: 50% Bar. Press.: 760 mm Hg

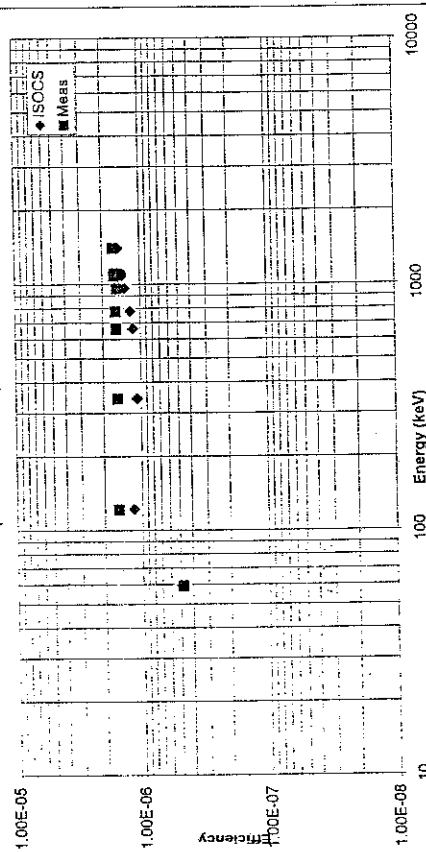
Convergence: 0.1%

Units: Length: cm Density: g/cc

Source material: 72.1%²²Na+21.9%⁶⁰Co

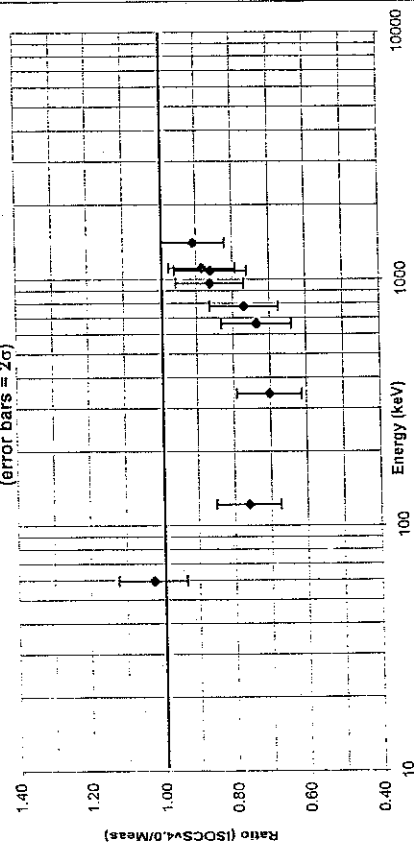
LINE SOURCE MEASUREMENTS, 30 DEG COLLIMATION

(error bars = 1σ)



LINE SOURCE MEASUREMENTS, 30 DEG COLLIMATION

(error bars = 2σ)



Comparison Results

Energy (keV)	ISOCS efficiency	Measurements			Ratio (ISOCS/Meas)
		efficiency	1 σ unc	2 σ rel.unc.	
59.54	4.95E-07	4.80E-07	2.24E-08	9.33E-02	1.03
121.78	1.17E-06	1.54E-06	6.84E-08	8.88E-02	0.76
344.29	1.08E-06	1.54E-06	6.86E-08	8.91E-02	0.70
661.66	1.15E-06	1.56E-06	7.48E-08	9.59E-02	0.74
778.92	1.21E-06	1.57E-06	7.48E-08	9.53E-02	0.77
964.11	1.32E-06	1.53E-06	7.13E-08	9.32E-02	0.86
1085.89	1.39E-06	1.61E-06	8.01E-08	9.95E-02	0.86
1112.08	1.40E-06	1.58E-06	7.30E-08	9.24E-02	0.89
1408	1.49E-06	1.64E-06	7.24E-08	8.83E-02	0.91
Mean					
		Dataset	Ratio	Std Dev	ISOCS
		<150 keV	0.85	0.21	0.20
		>150 keV	0.80	0.11	0.09
		All	0.81	0.12	0.11

ENVIRONMENTAL MEASUREMENTS, 50mm-180d COLLIMATOR

Date: November 6, 2000

ISOCS Version: 4.0

The environmental radionuclide concentration was measured in a parking lot. The Ge detector was 1 meter away and pointing to the ground. The efficiency calibration was performed using the ISOCS software. A "measured" efficiency was obtained for the collimator by treating the measured no_collimator activities as the "known" values.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

Detector: 42% (S/N 3578) New characterization

Collimator: 50mm-180d, CRPN=4

1=0.2 2=3=4=0 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0	5000						
(2) Src - Lr 1	50					DIRT2	1.6	1
(3...10) Source Layers 2...9 are all empty								
(11) Src - Lr 10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	0	0			

Air Temp: 20 C Rel Hum: 5.0% Bar. Press.: 760 mm Hg

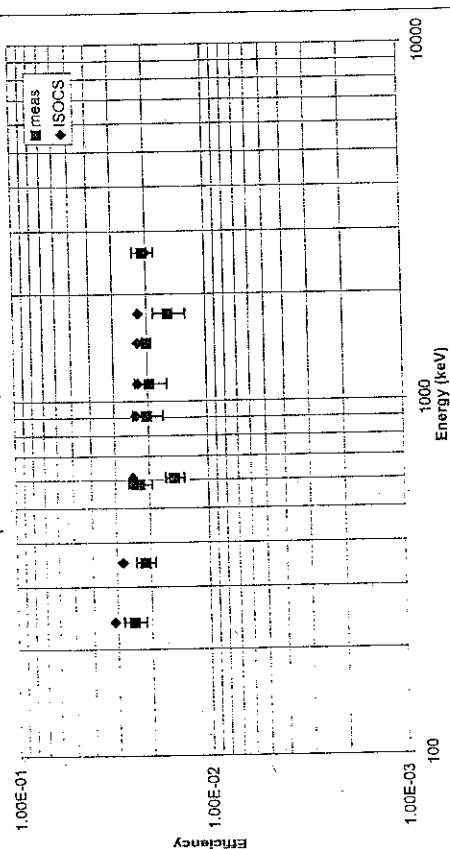
Convergence: 0.1%

Units: Length: cm Density: g/cc Counting time (sec) 3500

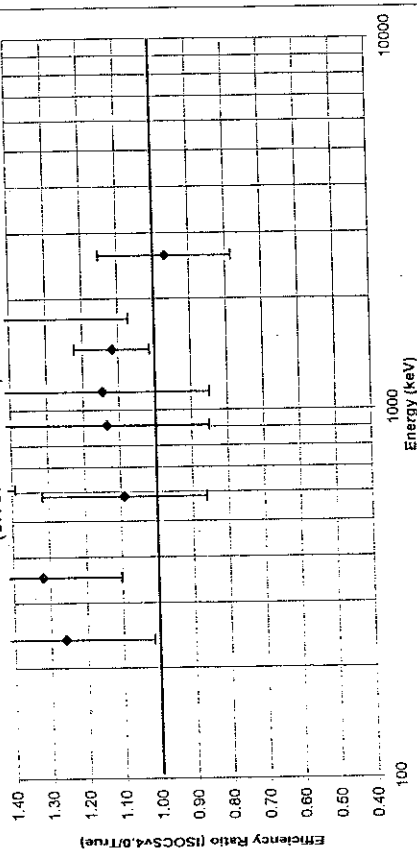
Comparison Results

Nuclide		Nuclide Activities in pCi / Kg									
		Energy (keV)	Gamma Intensity	Activity (No coll)	Peak area (180d coll)	Meas. eff (180d coll)	ISOCS eff	Eff. Ratio	2 σ Unc		
Radium		351.99	0.355	3.88E+02	3.91E+02	2.13E-02	2.82E-02	1.32	0.219		
		609.31	0.441	4.33E+02	3.77E+02	1.48E-02	2.44E-02	1.64	0.252		
		1120.29	0.144	3.72E+02	1.40E+02	1.96E-02	2.25E-02	1.15	0.297		
		1764.49	0.152	3.62E+02	1.14E+02	1.56E-02	2.22E-02	1.42	0.353		
Thorium		238.63	0.414	2.74E+02	3.73E+02	2.47E-02	3.12E-02	1.26	0.244		
		583.19	0.297	2.71E+02	2.42E+02	2.28E-02	2.48E-02	1.09	0.227		
		911.07	0.282	2.15E+02	1.65E+02	2.04E-02	2.32E-02	1.14	0.284		
		2614.50	0.345	2.41E+02	2.30E+02	2.08E-02	2.01E-02	0.97	0.185		
K-40		1460.80	0.1084	4.54E+03	1.29E+03	2.01E-02	2.24E-02	1.12	0.104		
										Wt. Mean	ISOCS
										Ratio	Std Dev
										Dataset	Std Dev
										<150 keV	0.12
										>150 keV	0.15
										All	0.12

Environmental Measurements 180 deg Collimator Efficiency

(error bars = 2 σ)

Environmental Measurements 180 deg Collimator Efficiency

(error bars = 2 σ)

ENVIRONMENTAL MEASUREMENTS, 50mm-90d COLLIMATOR

Date: November 6, 2000 ISOCS Version: 4.0

The environmental radionuclide concentration was measured in a parking lot. The Ge detector was 1 meter away and pointing to the ground. The efficiency calibration was performed using the ISOCS software. A "measured" efficiency was obtained for the collimator geometry by treating the measured no_collimator activities as the "known" values.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

Detector: 42% (S/N 3578) New characterization

Collimator: 50mm-90d, CRPN=4

1=0.2 2=5.08 3=2.54 4=7.62 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0	5000				DIRT2	1.6	1
(2) Src - Lr 1	50							
(3...10) Source Layers 2...9 are all empty								
(11) Src - Lr 10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	0	0			

Air: Temp:20 C Rel. Hum:5.0% Bar. Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc

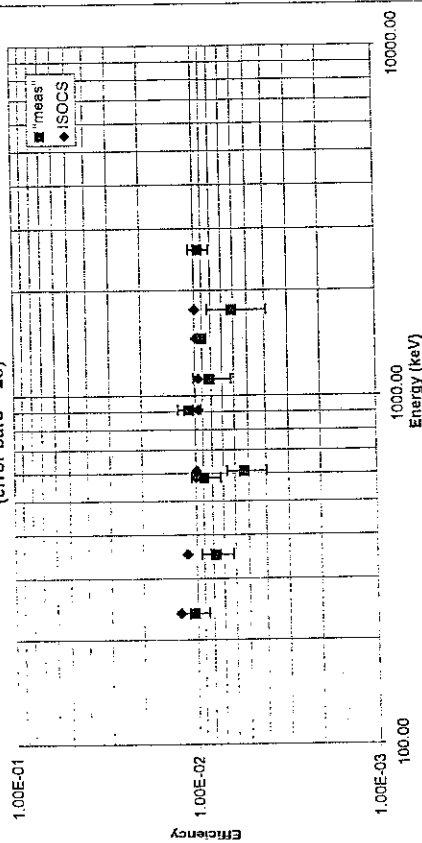
Counting time (sec)

7200

Comparison Results		Nuclide Activities in pCi / Kg									
Nuclide	Energy (keV)	Gamma Intensity	Activity (No coll)	Peak area (90d coll)	Meas. eff (90d coll)	ISOCS eff	Eff. Ratio ISOCS/meas	2σ Unc			
Radium	351.98	0.355	3.88E+02	2.85E+02	7.77E-03	1.13E-02	1.45	0.287			
	609.31	0.441	4.33E+02	2.70E+02	5.31E-03	9.91E-03	1.87	0.321			
	1120.29	0.144	3.72E+02	1.17E+02	8.20E-03	9.53E-03	1.16	0.317			
	1764.49	0.152	3.62E+02	8.97E+01	6.12E-03	9.93E-03	1.62	0.449			
Thorium	238.63	0.414	2.74E+02	3.14E+02	1.04E-02	1.24E-02	1.20	0.249			
	583.19	0.297	2.71E+02	1.91E+02	8.90E-03	9.99E-03	1.12	0.252			
	911.07	0.282	2.15E+02	1.75E+02	1.08E-02	9.69E-03	0.89	0.215			
	2614.50	0.345	2.41E+02	2.08E+02	9.41E-03	9.24E-03	0.98	0.193			
K-40	1460.80	0.1064	4.54E+03	1.16E+03	9.02E-03	9.82E-03	1.09	0.102			
									Wt. Mean	Wt. Rel.	ISOCS
									Ratio	Std Dev	Std Dev
									<150 keV	1.14	0.20
									>150 keV	1.14	0.18
									All	1.14	0.20
										0.20	0.18

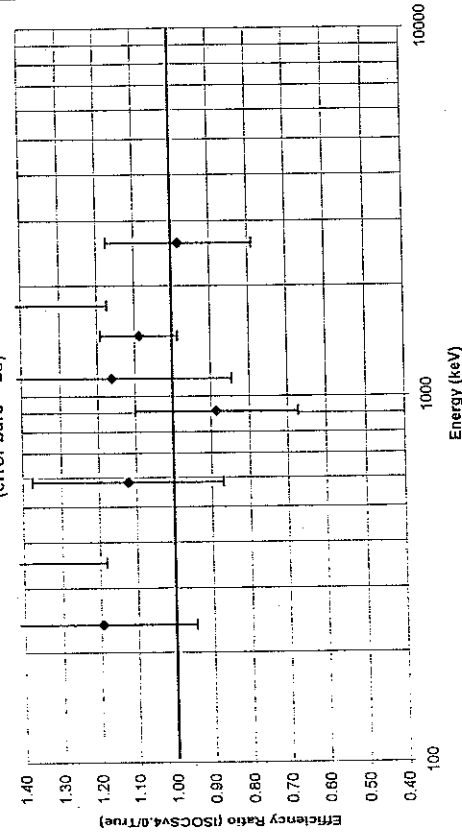
Environmental Measurements 90 deg collimator efficiency

(error bars = 2σ)



Environmental Measurements 90 deg Collimator Efficiency

(error bars = 2σ)



* ENVIRONMENTAL MEASUREMENTS, 50mm-30d COLLIMATOR

Date: November 6, 2000 ISOCS Version: 4.0

The environmental radionuclide concentration was measured in a parking lot. The Ge detector was 1 meter away and pointing to the ground. The efficiency calibration was performed using the ISOCS software. A "measured" efficiency was obtained for the collimator geometry by treating the measured no_collimator activities as the "known" values.

ISOCS Geometry Parameters

Template: CIRCULAR PLANE

Detector: 42% (S/N 3578) New characterization

Collimator: 50mm-30d, CRPN=4

1=0.2 2=5.08 3=0.68 4=2.05 5=10.16 6=5.08 7=15.24 8=5.08 9=3.4 mat=Pb dens=11.35

Item	d.1	d.2	d.3	d.4	d.5	Material	Density	Conc.
(1) Side Wall	0	5000				DIRT2	1.6	1
(2) Src - Lr 1	50							
(3...10) Source Layers 2...9 are all empty								
(11) Src - Lr 10								
(12) Absorber 1								
(13) Absorber 2								
(14) Src-Det	100	0	0	0	0			

Air: Temp: 20 C Rel. Hum: 5.0% Bar: Press.: 760 mm Hg

Convergence: 0.1%

Units: Length: cm Density: g/cc Counting time (sec) 21600

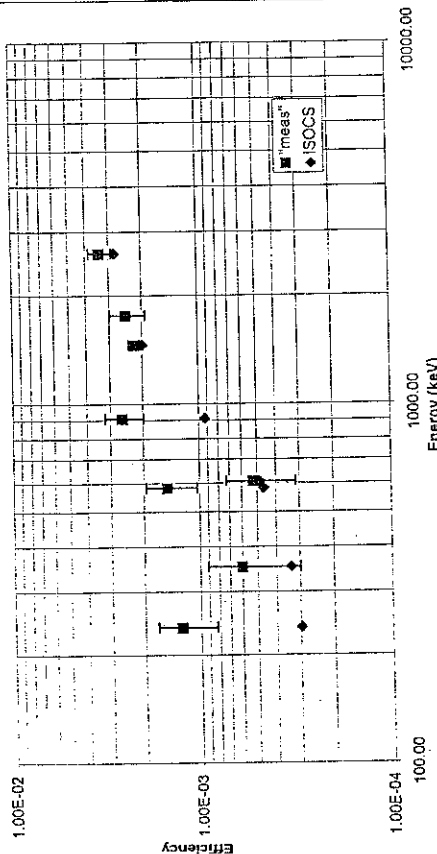
Comparison Results

Nuclide	Energy (keV)	Gamma intensity	Activity (No coll)	Nuclide Activities in pCi / Kg			
				Peak area (30d coll)	Meas. eff (30d coll)	ISOCS eff	Eff. Ratio ISOCS/meas
Radium	351.99	0.355	3.88E+02	6.64E+01	6.04E-04	3.35E-04	0.56
	609.31	0.441	4.33E+02	7.93E+01	5.20E-04	4.85E-04	0.93
	1120.29	0.144	3.72E+02				
Thorium	1764.49	0.152	3.62E+02	1.08E+02	2.46E-03	2.45E-03	1.00
	238.63	0.414	2.74E+02	1.15E+02	1.27E-03	2.88E-04	0.23
	583.19	0.297	2.71E+02	9.61E+01	1.49E-03	4.63E-04	0.31
	911.07	0.282	2.15E+02	1.26E+02	2.60E-03	9.28E-04	0.36
	2614.50	0.345	2.41E+02	2.24E+02	3.38E-03	2.80E-03	0.83
K-40	1460.80	0.1064	4.54E+03	8.57E+02	2.22E-03	2.00E-03	0.90

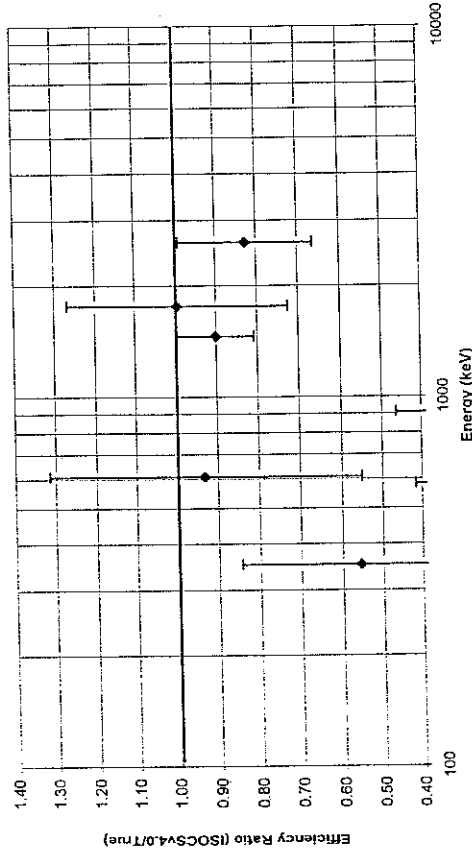
Note: A T-test was performed and it indicates that this data is an outlier. The explanation is likely that the area of the parking lot directly under the detector was lower in activity than the average surrounding "known" area.

Dataset	Wt. Mean Ratio	Wt. Rel. Std Dev	ISOCS Std Dev
<150 keV	0.51	0.61	0.59
>150 keV	0.51	0.51	0.59
All			

Environmental Measurements 30 deg collimator efficiency



Environmental Measurements 30 deg Collimator Efficiency



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