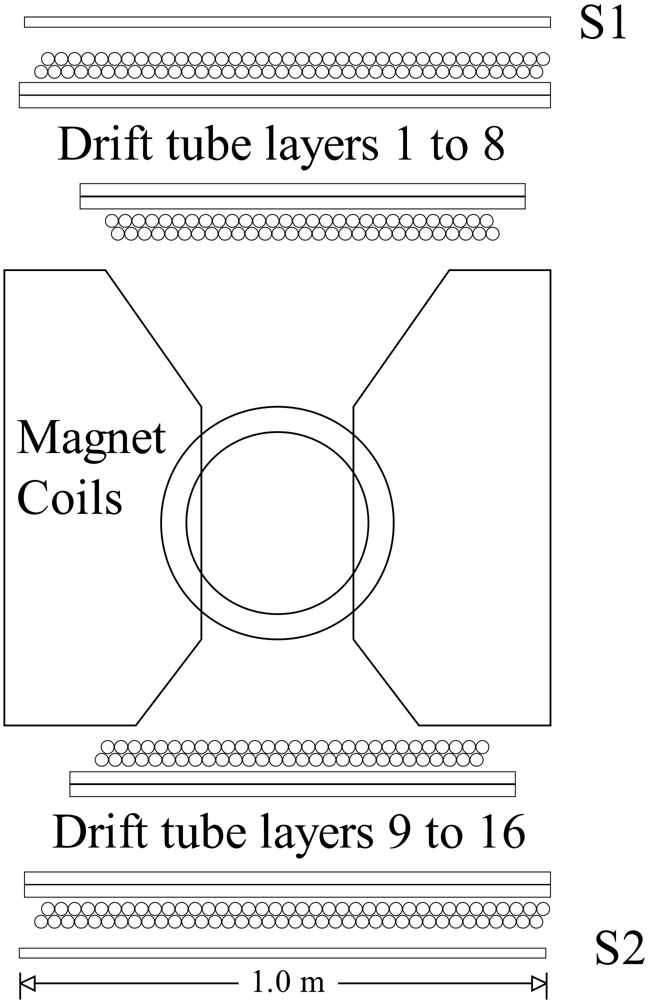
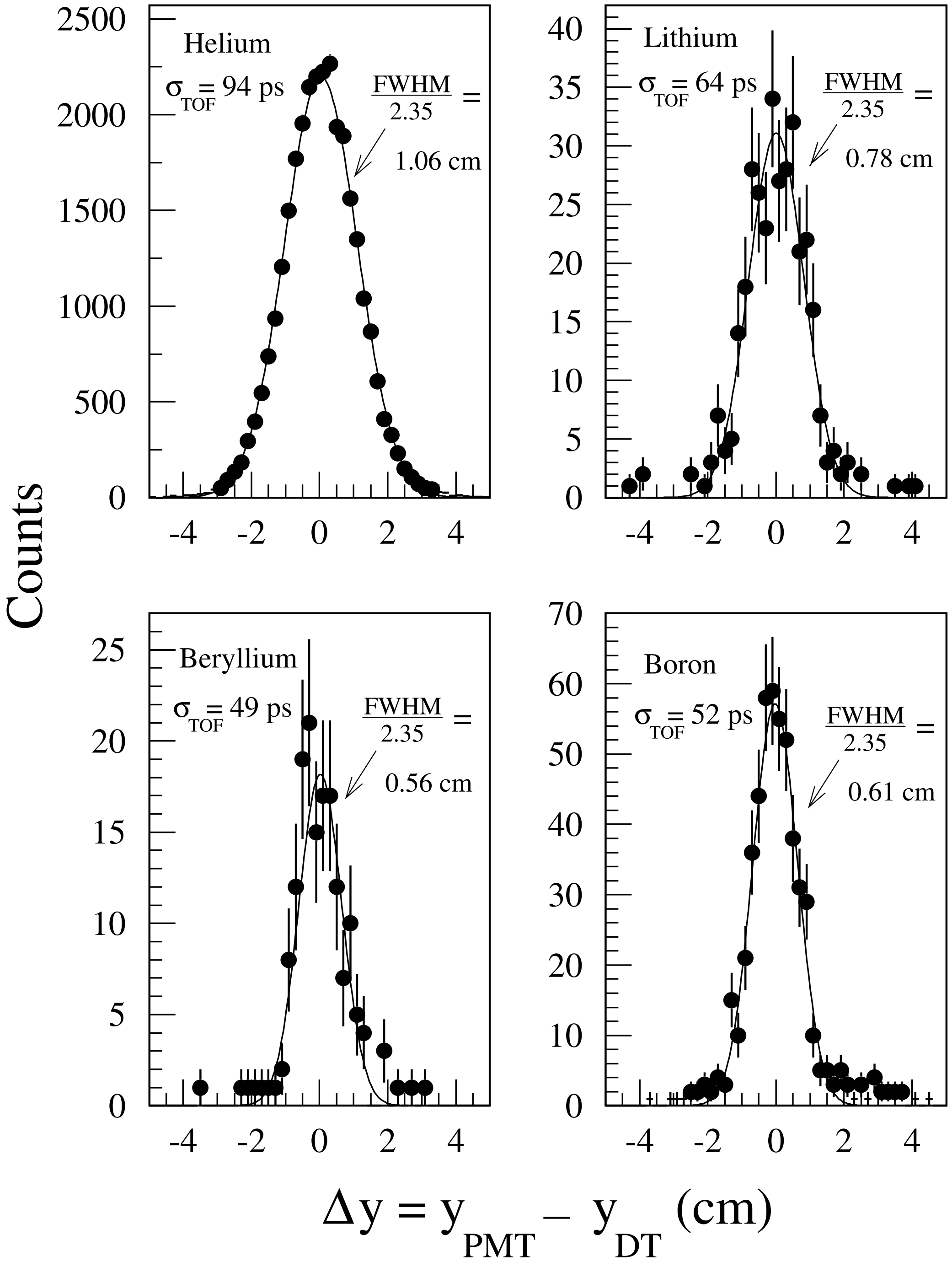
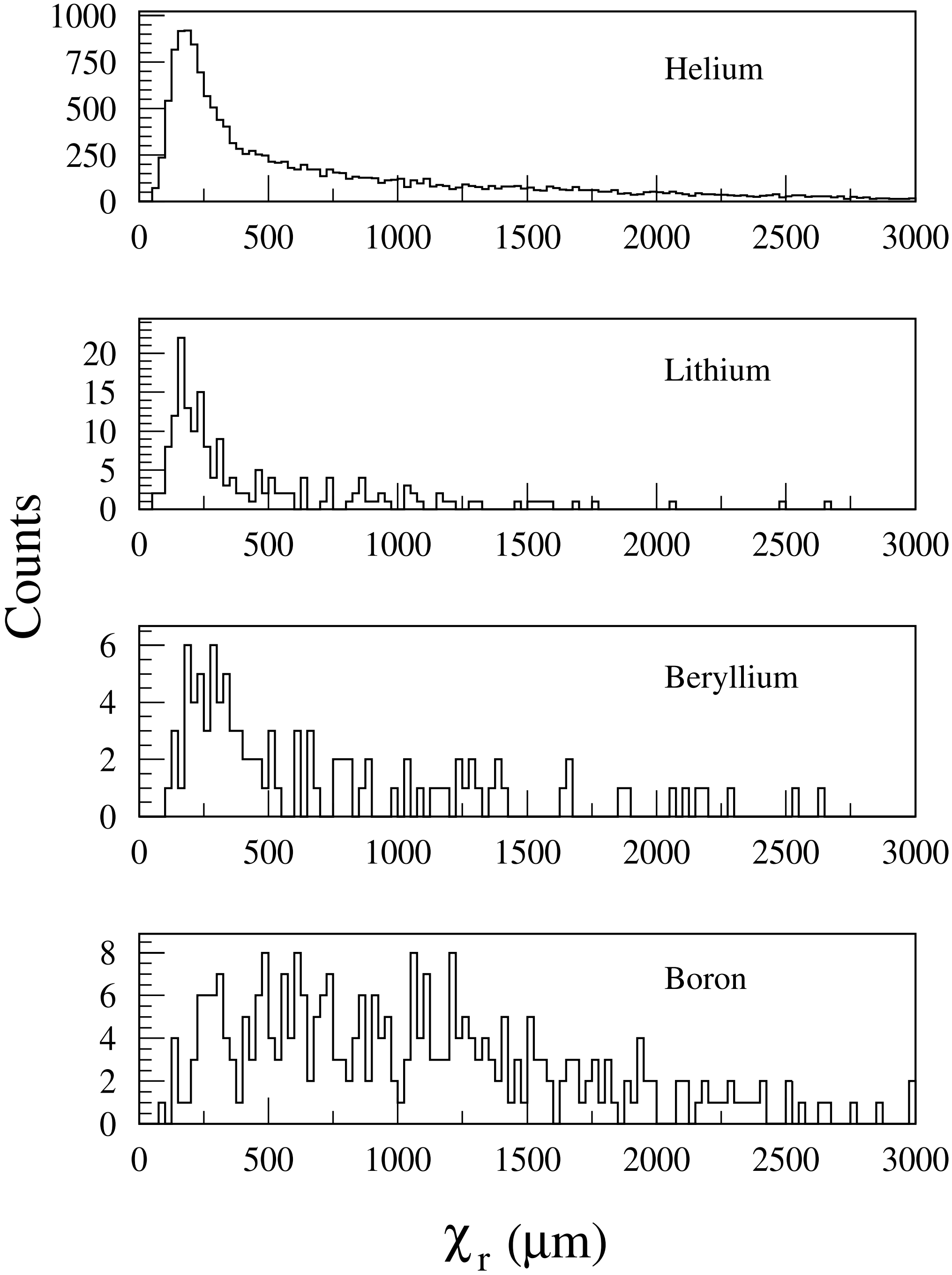
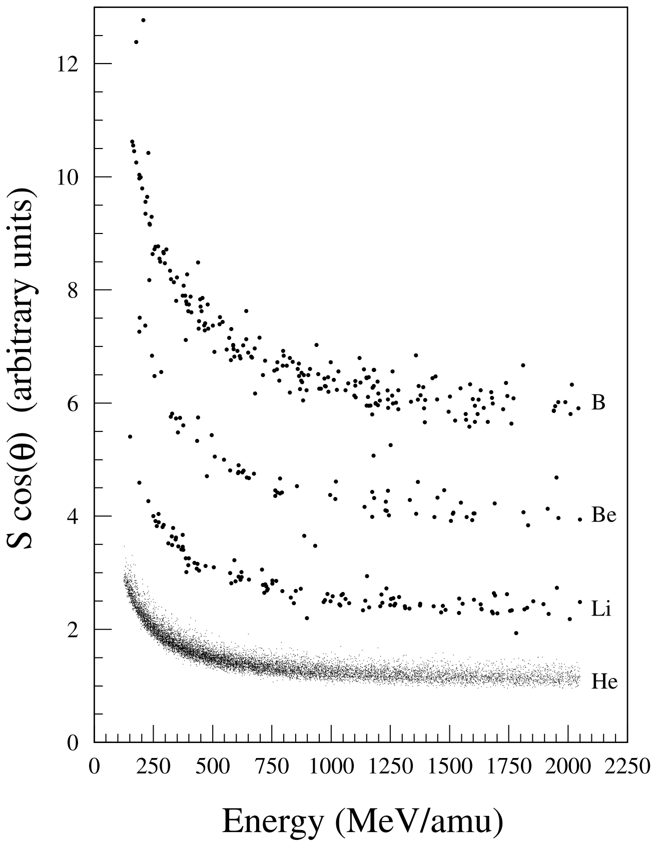
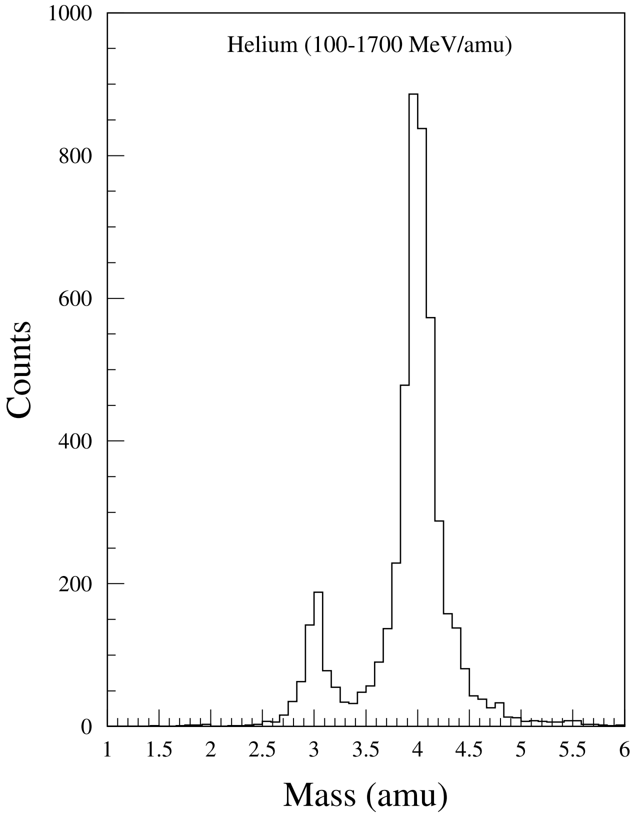
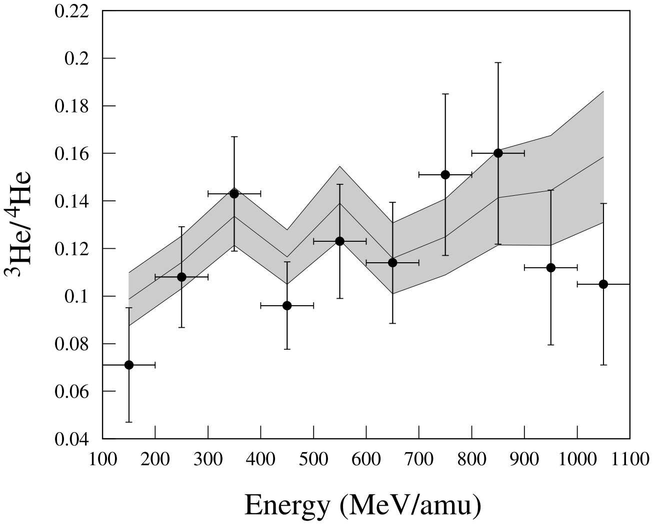

S1
Drift tube layers 1 to 8
Magnet
Coils
Drift tube layers 9 to 16
S2
1.0 m

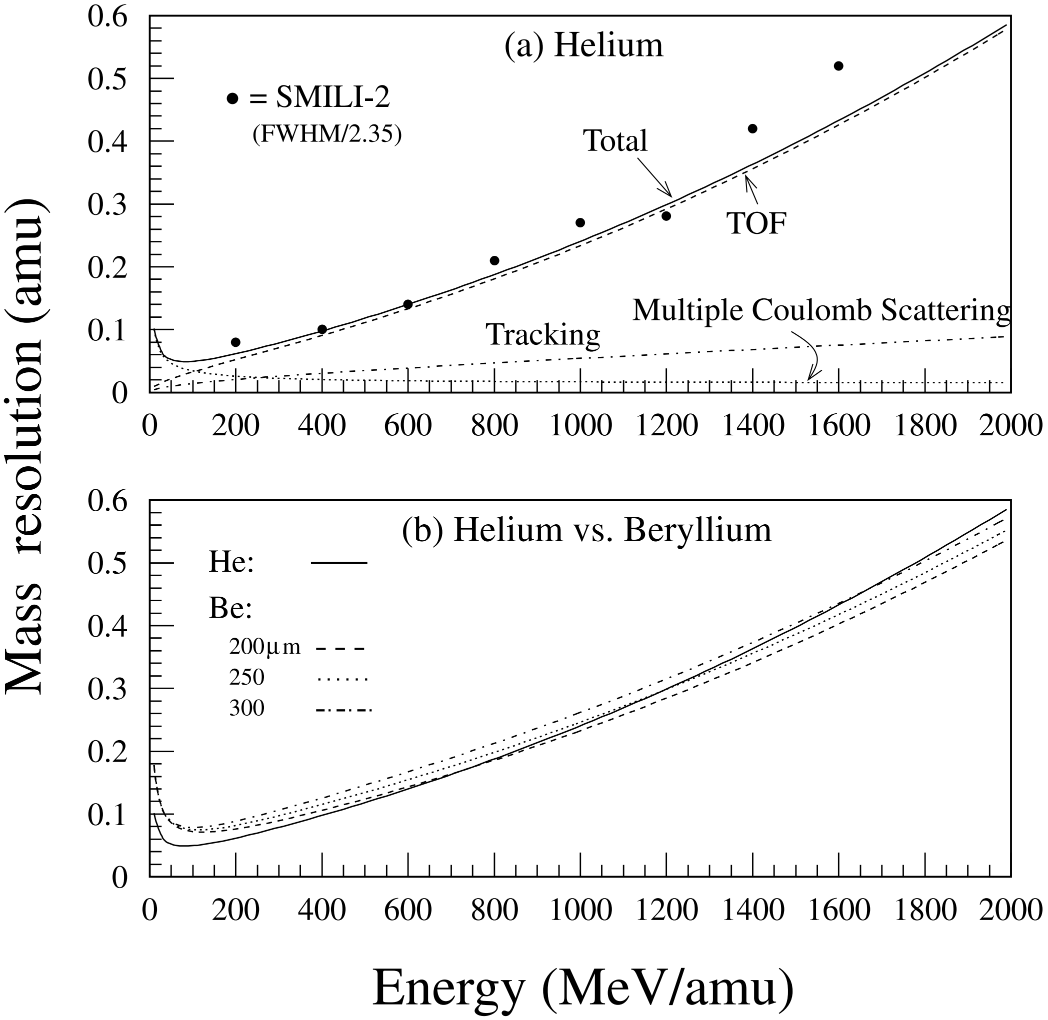

Counts
Helium
σ_{TOF} = 94 ps
$\frac{FWHM}{2.35}$ =
1.06 cm
Lithium
σ_{TOF} = 64 ps
$\frac{FWHM}{2.35}$ =
0.78 cm
Beryllium
σ_{TOF} = 49 ps
$\frac{FWHM}{2.35}$ =
0.56 cm
Boron
σ_{TOF} = 52 ps
$\frac{FWHM}{2.35}$ =
0.61 cm
0
500
1000
1500
2000
2500
0
5
10
15
20
25
30
35
40
0
5
10
15
20
25
0
10
20
30
40
50
60
70
-4
-2
0
2
4
$\Delta y = y_{PMT} - y_{DT}$ (cm)

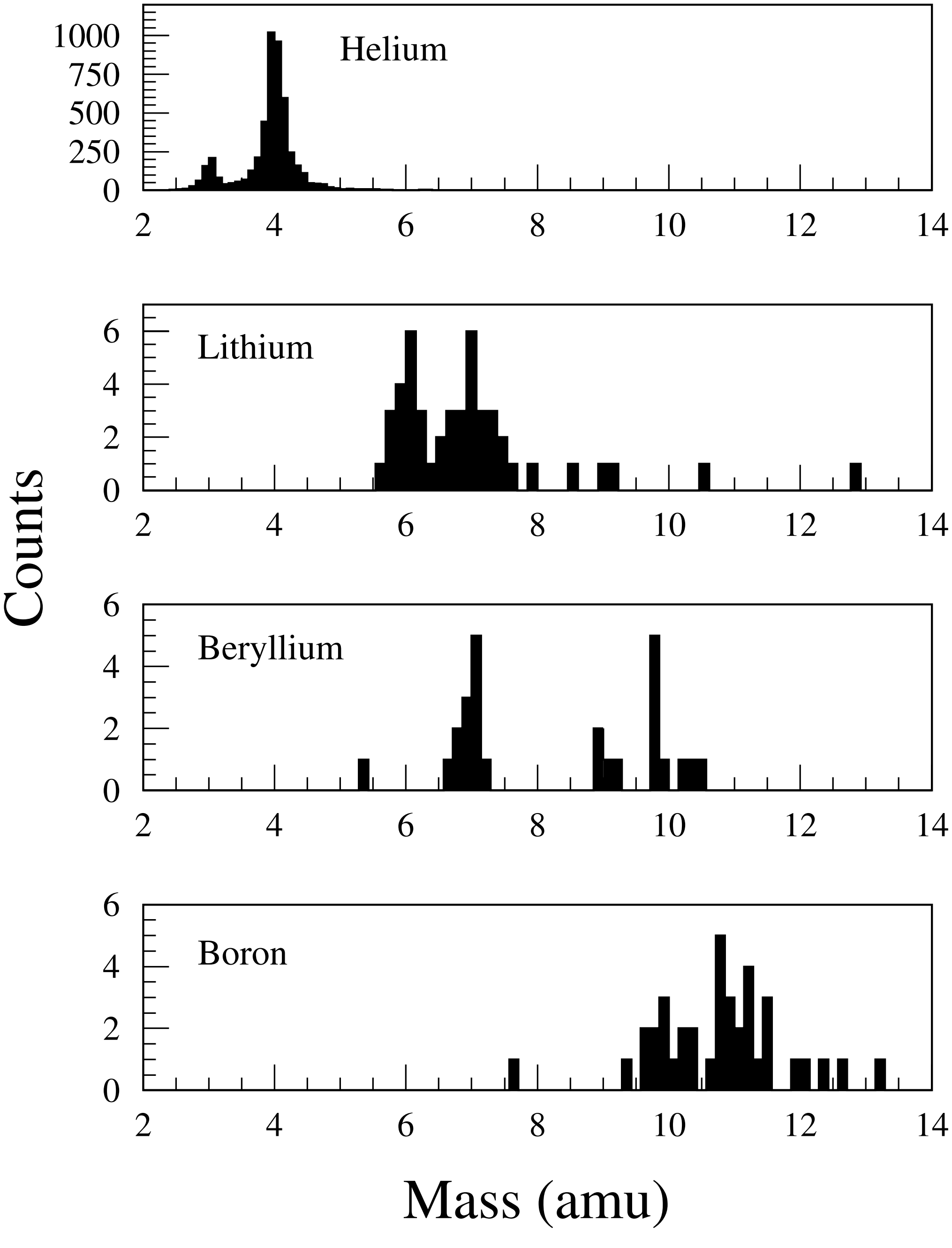

Helium
Lithium
Beryllium
Boron
Counts
χ_r (μm)
1000
750
500
250
20
15
10
5
6
4
2
8
0
500
1000
1500
2000
2500
3000


S cos(θ) (arbitrary units)
0
2
4
6
8
10
12
B
Be
Li
He
0
250
500
750
1000
1250
1500
1750
2000
2250
Energy (MeV/amu)


Helium (100-1700 MeV/amu)
Counts
0
200
400
600
800
1000
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6
Mass (amu)

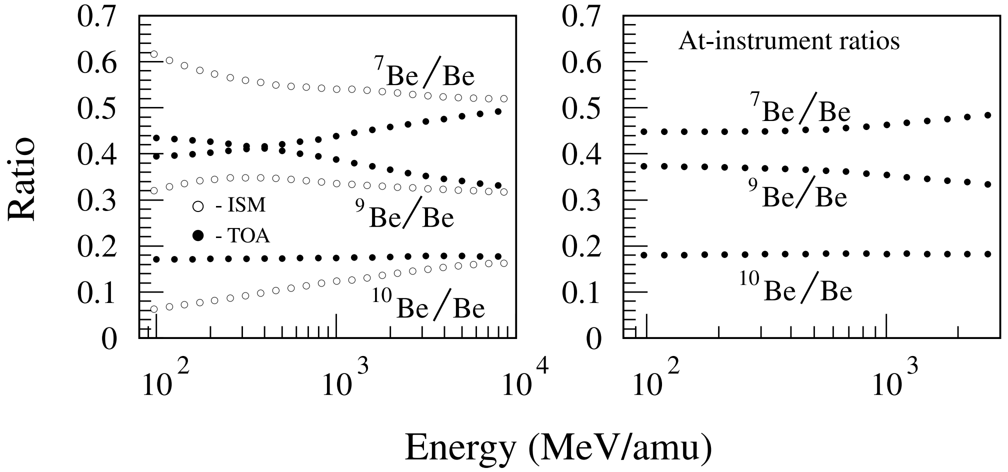

^{3}He/^{4}He
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
0.22
100
200
300
400
500
600
700
800
900
1000
1100
Energy (MeV/amu)


(a) Helium
● = SMILI-2
(FWHM/2.35)
Total
TOF
Multiple Coulomb Scattering
Tracking
(b) Helium vs. Beryllium
He:
Be:
200µm
250
300
Mass resolution (amu)
Energy (MeV/amu)
0
0.1
0.2
0.3
0.4
0.5
0.6
0
200
400
600
800
1000
1200
1400
1600
1800
2000

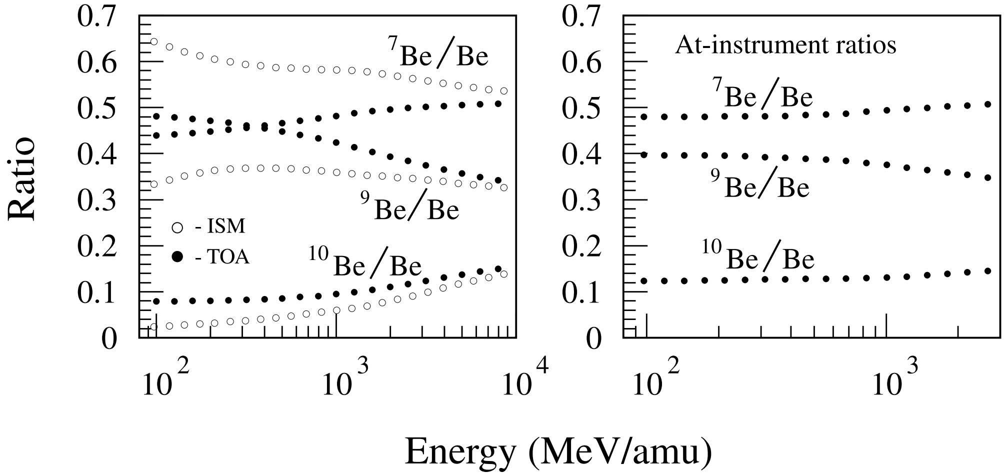


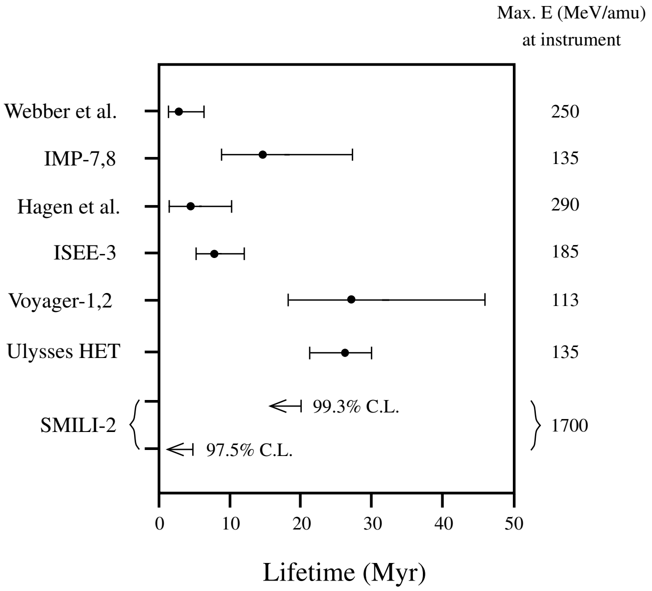
Helium
Lithium
Beryllium
Boron
Counts
Mass (amu)
1000
750
500
250
0
6
4
2
2
4
6
8
10
12
14

(a) $\bar{n} = 1$ amu/cc



(b) $\bar{n} = 0.24$ amu/cc




Max. E (MeV/amu)
at instrument
Webber et al.
IMP-7,8
Hagen et al.
ISEE-3
Voyager-1,2
Ulysses HET
SMILI-2
99.3% C.L.
97.5% C.L.
250
135
290
185
113
135
1700
0
10
20
30
40
50
Lifetime (Myr)

low-mass berylliums, other than the fact that the ^{10}Be excess occurs above 1 GeV amu $^{-1}$ (see Table 1, where key parameters for each of the final 26 beryllium events are given). However, there is the possibility that the large excess of ^{10}Be is a statistical fluctuation, either of the number of ^{10}Be produced or of the spillover of ^{9}Be events into the ^{10}Be mass region.

We anxiously await the results of the ISOMAX superconducting magnet balloon experiment (Streitmatter et al. 1993), which was designed to measure the beryllium composition at large energy and which flew in 1998. ISOMAX has considerably greater geometrical acceptance than SMILI, and will be able to address the possibility that our measurement is the result of a statistical fluctuation.

$^{-1}$ in inter-

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