Observation of New Properties of Secondary Cosmic Rays Lithium, Beryllium, and Boron by the Alpha Magnetic Spectrometer on the International Space Station
- SUPPLEMENTAL MATERIAL -

(AMS Collaboration)

For references see the main text.

Detector.— The tracker has nine layers, the first ($L1$) at the top of the detector, the second ($L2$) above the magnet, six ($L3$ to $L8$) within the bore of the magnet, and the last ($L9$) above the ECAL. $L2$ to $L8$ constitute the inner tracker. Each layer of the tracker provides an independent measurement of the charge Z with a resolution of $\Delta Z/Z = 4$–6% for $3 \leq Z \leq 5$ events. Overall the inner tracker has a resolution of $\Delta Z/Z = 2$–3% for $3 \leq Z \leq 5$ events. The spatial resolution in each tracker layer is 5.3–5.8 μm in the bending direction for $3 \leq Z \leq 5$ events [22]. Together, the tracker and the magnet measure the rigidity R of charged cosmic rays, with a maximum detectable rigidity (MDR) of 3.5–3.7 TV over the 3 m lever arm from $L1$ to $L9$, and of $\sim$1.4 TV over the lever arm from $L1$ to $L8$ for $3 \leq Z \leq 5$ events.

Two of the TOF planes are located above the magnet (upper TOF) and two planes are below (lower TOF). The overall velocity ($\beta = v/c$) resolution has been measured to be $\Delta\beta/\beta^2$ =0.012–0.015 for $3 \leq Z \leq 5$ events. This discriminates between upward- and downward-going particles. The pulse heights of the two upper planes are combined to provide an independent measurement of the charge with an accuracy $\Delta Z/Z$ between 3.5–5% for $3 \leq Z \leq 5$ events. The pulse heights from the two lower planes are combined to provide another independent charge measurement with the same accuracy.

TABLE SM I: The lithium flux Φ_{Li} as a function of rigidity at the top of AMS in units of $[\mathrm{m}^2 \cdot \mathrm{sr} \cdot \mathrm{s} \cdot \mathrm{GV}]^{-1}$ including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic error.

Rigidity [GV]	Φ_{Li}	$\sigma_{\mathrm{stat.}}$	$\sigma_{\mathrm{acc.}}$	$\sigma_{\mathrm{unf.}}$	σ_{scale}	$\sigma_{\mathrm{syst.}}$
1.92 – 2.15	(2.422	0.015	0.073	0.018	0.011	0.076) $\times 10^{-1}$
2.15 – 2.40	(2.536	0.014	0.071	0.015	0.009	0.073) $\times 10^{-1}$
2.40 – 2.67	(2.541	0.012	0.069	0.013	0.006	0.070) $\times 10^{-1}$
2.67 – 2.97	(2.454	0.011	0.065	0.010	0.004	0.066) $\times 10^{-1}$
2.97 – 3.29	(2.297	0.009	0.060	0.008	0.002	0.061) $\times 10^{-1}$
3.29 – 3.64	(2.075	0.008	0.054	0.007	0.001	0.055) $\times 10^{-1}$
3.64 – 4.02	(1.835	0.007	0.048	0.005	0.001	0.048) $\times 10^{-1}$
4.02 – 4.43	(1.608	0.006	0.042	0.004	0.001	0.042) $\times 10^{-1}$
4.43 – 4.88	(1.383	0.005	0.036	0.004	0.002	0.036) $\times 10^{-1}$
4.88 – 5.37	(1.178	0.004	0.031	0.003	0.002	0.031) $\times 10^{-1}$
5.37 – 5.90	(9.898	0.033	0.256	0.027	0.022	0.258) $\times 10^{-2}$
5.90 – 6.47	(8.217	0.028	0.213	0.023	0.020	0.215) $\times 10^{-2}$
6.47 – 7.09	(6.803	0.023	0.176	0.020	0.019	0.178) $\times 10^{-2}$
7.09 – 7.76	(5.558	0.019	0.144	0.017	0.017	0.146) $\times 10^{-2}$
7.76 – 8.48	(4.519	0.015	0.117	0.014	0.014	0.119) $\times 10^{-2}$
8.48 – 9.26	(3.667	0.013	0.095	0.012	0.012	0.096) $\times 10^{-2}$
9.26 – 10.1	(2.965	0.011	0.077	0.010	0.010	0.078) $\times 10^{-2}$
10.1 – 11.0	(2.380	0.009	0.062	0.009	0.009	0.063) $\times 10^{-2}$
11.0 – 12.0	(1.892	0.008	0.049	0.007	0.007	0.050) $\times 10^{-2}$
12.0 – 13.0	(1.537	0.007	0.040	0.006	0.006	0.041) $\times 10^{-2}$
13.0 – 14.1	(1.227	0.006	0.032	0.005	0.005	0.032) $\times 10^{-2}$
14.1 – 15.3	(9.926	0.048	0.257	0.038	0.042	0.263) $\times 10^{-3}$
15.3 – 16.6	(7.910	0.041	0.205	0.030	0.034	0.210) $\times 10^{-3}$
16.6 – 18.0	(6.250	0.034	0.162	0.024	0.028	0.166) $\times 10^{-3}$
18.0 – 19.5	(4.998	0.029	0.129	0.019	0.022	0.133) $\times 10^{-3}$
19.5 – 21.1	(3.975	0.024	0.103	0.015	0.018	0.106) $\times 10^{-3}$
21.1 – 22.8	(3.187	0.020	0.083	0.012	0.015	0.085) $\times 10^{-3}$
22.8 – 24.7	(2.542	0.016	0.066	0.010	0.012	0.068) $\times 10^{-3}$
24.7 – 26.7	(2.005	0.013	0.052	0.008	0.010	0.053) $\times 10^{-3}$
26.7 – 28.8	(1.605	0.011	0.042	0.006	0.008	0.043) $\times 10^{-3}$
28.8 – 31.1	(1.293	0.009	0.034	0.005	0.006	0.034) $\times 10^{-3}$
31.1 – 33.5	(1.019	0.008	0.026	0.004	0.005	0.027) $\times 10^{-3}$
33.5 – 36.1	(8.109	0.067	0.211	0.031	0.041	0.217) $\times 10^{-4}$
36.1 – 38.9	(6.436	0.057	0.167	0.024	0.033	0.172) $\times 10^{-4}$
38.9 – 41.9	(5.191	0.050	0.135	0.020	0.027	0.139) $\times 10^{-4}$
41.9 – 45.1	(4.119	0.043	0.107	0.016	0.022	0.111) $\times 10^{-4}$
45.1 – 48.5	(3.342	0.037	0.087	0.013	0.018	0.090) $\times 10^{-4}$

Table continued

TABLE SM I – *(Continued).*

Rigidity [GV]	Φ_{Li}	$\sigma_{\mathrm{stat.}}$	$\sigma_{\mathrm{acc.}}$	$\sigma_{\mathrm{unf.}}$	σ_{scale}	$\sigma_{\mathrm{syst.}}$	
48.5 – 52.2	(2.575	0.031	0.067	0.010	0.014	0.070)	$\times 10^{-4}$
52.2 – 56.1	(2.083	0.027	0.055	0.009	0.012	0.057)	$\times 10^{-4}$
56.1 – 60.3	(1.660	0.024	0.044	0.007	0.010	0.045)	$\times 10^{-4}$
60.3 – 64.8	(1.353	0.020	0.036	0.006	0.008	0.037)	$\times 10^{-4}$
64.8 – 69.7	(1.060	0.017	0.028	0.005	0.006	0.029)	$\times 10^{-4}$
69.7 – 74.9	(8.543	0.151	0.226	0.041	0.053	0.235)	$\times 10^{-5}$
74.9 – 80.5	(6.674	0.128	0.177	0.034	0.043	0.185)	$\times 10^{-5}$
80.5 – 86.5	(5.332	0.111	0.142	0.028	0.035	0.149)	$\times 10^{-5}$
86.5 – 93.0	(4.384	0.096	0.117	0.025	0.030	0.123)	$\times 10^{-5}$
93.0 – 100	(3.307	0.081	0.088	0.020	0.023	0.093)	$\times 10^{-5}$
100 – 108	(2.681	0.068	0.072	0.017	0.019	0.076)	$\times 10^{-5}$
108 – 116	(2.030	0.059	0.055	0.014	0.015	0.058)	$\times 10^{-5}$
116 – 125	(1.602	0.049	0.043	0.012	0.012	0.047)	$\times 10^{-5}$
125 – 135	(1.291	0.042	0.035	0.010	0.010	0.038)	$\times 10^{-5}$
135 – 147	(1.070	0.035	0.029	0.009	0.009	0.032)	$\times 10^{-5}$
147 – 160	(8.319	0.294	0.226	0.075	0.073	0.249)	$\times 10^{-6}$
160 – 175	(6.400	0.240	0.175	0.063	0.059	0.195)	$\times 10^{-6}$
175 – 192	(4.666	0.192	0.128	0.050	0.046	0.145)	$\times 10^{-6}$
192 – 211	(3.460	0.156	0.095	0.041	0.036	0.110)	$\times 10^{-6}$
211 – 233	(2.542	0.124	0.071	0.033	0.028	0.083)	$\times 10^{-6}$
233 – 259	(2.065	0.103	0.057	0.030	0.025	0.069)	$\times 10^{-6}$
259 – 291	(1.278	0.073	0.036	0.021	0.017	0.045)	$\times 10^{-6}$
291 – 330	(9.324	0.561	0.263	0.173	0.136	0.343)	$\times 10^{-7}$
330 – 379	(7.162	0.438	0.202	0.152	0.117	0.279)	$\times 10^{-7}$
379 – 441	(4.970	0.324	0.141	0.123	0.092	0.208)	$\times 10^{-7}$
441 – 525	(2.203	0.185	0.063	0.065	0.047	0.102)	$\times 10^{-7}$
525 – 660	(1.573	0.123	0.045	0.058	0.040	0.083)	$\times 10^{-7}$
660 – 880	(7.162	0.650	0.209	0.351	0.229	0.468)	$\times 10^{-8}$
880 – 1300	(2.742	0.291	0.083	0.195	0.117	0.242)	$\times 10^{-8}$
1300 – 3300	(0.520	0.127	0.022	0.044	0.026	0.055)	$\times 10^{-8}$

TABLE SM II: The beryllium flux Φ_{Be} as a function of rigidity at the top of AMS in units of $[\mathrm{m}^2 \cdot \mathrm{sr} \cdot \mathrm{s} \cdot \mathrm{GV}]^{-1}$ including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic error.

Rigidity [GV]	Φ_{Be}	$\sigma_{\mathrm{stat.}}$	$\sigma_{\mathrm{acc.}}$	$\sigma_{\mathrm{unf.}}$	σ_{scale}	$\sigma_{\mathrm{syst.}}$
1.92 – 2.15	(1.343	0.011	0.044	0.010	0.005	0.045) $\times 10^{-1}$
2.15 – 2.40	(1.343	0.010	0.042	0.008	0.004	0.043) $\times 10^{-1}$
2.40 – 2.67	(1.268	0.009	0.039	0.007	0.002	0.039) $\times 10^{-1}$
2.67 – 2.97	(1.205	0.008	0.036	0.006	0.002	0.036) $\times 10^{-1}$
2.97 – 3.29	(1.128	0.007	0.033	0.005	0.001	0.033) $\times 10^{-1}$
3.29 – 3.64	(1.003	0.006	0.029	0.004	0.000	0.029) $\times 10^{-1}$
3.64 – 4.02	(8.879	0.049	0.249	0.032	0.005	0.251) $\times 10^{-2}$
4.02 – 4.43	(7.661	0.041	0.213	0.026	0.008	0.215) $\times 10^{-2}$
4.43 – 4.88	(6.578	0.034	0.181	0.021	0.010	0.183) $\times 10^{-2}$
4.88 – 5.37	(5.613	0.027	0.154	0.018	0.011	0.155) $\times 10^{-2}$
5.37 – 5.90	(4.661	0.023	0.127	0.015	0.010	0.128) $\times 10^{-2}$
5.90 – 6.47	(3.879	0.019	0.105	0.012	0.010	0.107) $\times 10^{-2}$
6.47 – 7.09	(3.190	0.016	0.087	0.010	0.009	0.088) $\times 10^{-2}$
7.09 – 7.76	(2.597	0.013	0.070	0.008	0.008	0.071) $\times 10^{-2}$
7.76 – 8.48	(2.080	0.011	0.056	0.007	0.007	0.057) $\times 10^{-2}$
8.48 – 9.26	(1.704	0.009	0.046	0.006	0.006	0.047) $\times 10^{-2}$
9.26 – 10.1	(1.381	0.008	0.037	0.005	0.005	0.038) $\times 10^{-2}$
10.1 – 11.0	(1.108	0.006	0.030	0.004	0.004	0.030) $\times 10^{-2}$
11.0 – 12.0	(8.755	0.053	0.237	0.029	0.033	0.241) $\times 10^{-3}$
12.0 – 13.0	(7.209	0.047	0.195	0.023	0.028	0.198) $\times 10^{-3}$
13.0 – 14.1	(5.778	0.040	0.157	0.019	0.023	0.159) $\times 10^{-3}$
14.1 – 15.3	(4.626	0.034	0.125	0.015	0.019	0.128) $\times 10^{-3}$
15.3 – 16.6	(3.717	0.028	0.101	0.012	0.016	0.103) $\times 10^{-3}$
16.6 – 18.0	(3.030	0.024	0.082	0.009	0.013	0.084) $\times 10^{-3}$
18.0 – 19.5	(2.385	0.020	0.065	0.007	0.010	0.066) $\times 10^{-3}$
19.5 – 21.1	(1.932	0.017	0.053	0.006	0.009	0.054) $\times 10^{-3}$
21.1 – 22.8	(1.560	0.014	0.042	0.005	0.007	0.043) $\times 10^{-3}$
22.8 – 24.7	(1.230	0.011	0.034	0.004	0.006	0.034) $\times 10^{-3}$
24.7 – 26.7	(9.664	0.094	0.265	0.028	0.045	0.270) $\times 10^{-4}$
26.7 – 28.8	(7.775	0.079	0.214	0.023	0.037	0.218) $\times 10^{-4}$
28.8 – 31.1	(6.284	0.066	0.173	0.018	0.030	0.176) $\times 10^{-4}$
31.1 – 33.5	(5.114	0.058	0.141	0.015	0.025	0.144) $\times 10^{-4}$
33.5 – 36.1	(4.045	0.049	0.112	0.012	0.020	0.114) $\times 10^{-4}$
36.1 – 38.9	(3.259	0.042	0.091	0.010	0.016	0.093) $\times 10^{-4}$
38.9 – 41.9	(2.608	0.036	0.073	0.008	0.013	0.074) $\times 10^{-4}$
41.9 – 45.1	(2.035	0.031	0.057	0.007	0.011	0.058) $\times 10^{-4}$
45.1 – 48.5	(1.670	0.027	0.047	0.006	0.009	0.048) $\times 10^{-4}$

Table continued

TABLE SM II – *(Continued).*

Rigidity [GV]	Φ_{Be}	$\sigma_{\mathrm{stat.}}$	$\sigma_{\mathrm{acc.}}$	$\sigma_{\mathrm{unf.}}$	σ_{scale}	$\sigma_{\mathrm{syst.}}$	
48.5 – 52.2	(1.321	0.023	0.037	0.005	0.007	0.038)	$\times 10^{-4}$
52.2 – 56.1	(1.057	0.020	0.030	0.004	0.006	0.031)	$\times 10^{-4}$
56.1 – 60.3	(8.505	0.174	0.244	0.033	0.048	0.251)	$\times 10^{-5}$
60.3 – 64.8	(6.925	0.151	0.199	0.028	0.040	0.205)	$\times 10^{-5}$
64.8 – 69.7	(5.271	0.127	0.154	0.023	0.032	0.158)	$\times 10^{-5}$
69.7 – 74.9	(4.422	0.112	0.129	0.020	0.027	0.133)	$\times 10^{-5}$
74.9 – 80.5	(3.349	0.094	0.099	0.017	0.021	0.103)	$\times 10^{-5}$
80.5 – 86.5	(2.813	0.083	0.083	0.015	0.019	0.087)	$\times 10^{-5}$
86.5 – 93.0	(2.365	0.073	0.070	0.014	0.016	0.073)	$\times 10^{-5}$
93.0 – 100	(1.826	0.062	0.055	0.011	0.013	0.057)	$\times 10^{-5}$
100 – 108	(1.402	0.051	0.043	0.009	0.010	0.045)	$\times 10^{-5}$
108 – 116	(1.130	0.045	0.035	0.008	0.009	0.037)	$\times 10^{-5}$
116 – 125	(8.855	0.379	0.275	0.070	0.071	0.292)	$\times 10^{-6}$
125 – 135	(6.307	0.303	0.201	0.054	0.053	0.215)	$\times 10^{-6}$
135 – 147	(5.607	0.260	0.176	0.053	0.050	0.190)	$\times 10^{-6}$
147 – 160	(3.874	0.207	0.125	0.040	0.036	0.136)	$\times 10^{-6}$
160 – 175	(3.308	0.178	0.105	0.038	0.033	0.117)	$\times 10^{-6}$
175 – 192	(2.152	0.134	0.072	0.028	0.023	0.080)	$\times 10^{-6}$
192 – 211	(1.595	0.109	0.053	0.023	0.018	0.061)	$\times 10^{-6}$
211 – 233	(1.443	0.096	0.047	0.023	0.017	0.055)	$\times 10^{-6}$
233 – 259	(1.015	0.074	0.034	0.019	0.013	0.041)	$\times 10^{-6}$
259 – 291	(7.463	0.572	0.248	0.156	0.107	0.312)	$\times 10^{-7}$
291 – 330	(4.781	0.414	0.163	0.115	0.076	0.214)	$\times 10^{-7}$
330 – 379	(3.076	0.296	0.107	0.087	0.055	0.149)	$\times 10^{-7}$
379 – 441	(2.394	0.232	0.080	0.081	0.049	0.124)	$\times 10^{-7}$
441 – 525	(1.231	0.143	0.044	0.051	0.029	0.073)	$\times 10^{-7}$
525 – 660	(7.740	0.894	0.273	0.418	0.219	0.545)	$\times 10^{-8}$
660 – 880	(3.603	0.478	0.131	0.276	0.128	0.331)	$\times 10^{-8}$
880 – 1300	(1.250	0.204	0.050	0.148	0.058	0.167)	$\times 10^{-8}$
1300 – 3300	(0.140	0.071	0.009	0.016	0.008	0.020)	$\times 10^{-8}$

TABLE SM III: The boron flux Φ_B as a function of rigidity at the top of AMS in units of $[m^2 \cdot sr \cdot s \cdot GV]^{-1}$ including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic error.

Rigidity [GV]	Φ_B	$\sigma_{stat.}$	$\sigma_{acc.}$	$\sigma_{unf.}$	σ_{scale}	$\sigma_{syst.}$
1.92 – 2.15	(4.130	0.020	0.228	0.052	0.020	0.235) $\times 10^{-1}$
2.15 – 2.40	(4.254	0.018	0.211	0.041	0.015	0.215) $\times 10^{-1}$
2.40 – 2.67	(4.223	0.016	0.189	0.033	0.010	0.192) $\times 10^{-1}$
2.67 – 2.97	(3.936	0.014	0.160	0.026	0.005	0.162) $\times 10^{-1}$
2.97 – 3.29	(3.570	0.012	0.133	0.020	0.002	0.134) $\times 10^{-1}$
3.29 – 3.64	(3.184	0.010	0.110	0.015	0.001	0.111) $\times 10^{-1}$
3.64 – 4.02	(2.795	0.009	0.090	0.012	0.002	0.090) $\times 10^{-1}$
4.02 – 4.43	(2.411	0.007	0.073	0.009	0.003	0.073) $\times 10^{-1}$
4.43 – 4.88	(2.025	0.006	0.058	0.007	0.003	0.059) $\times 10^{-1}$
4.88 – 5.37	(1.715	0.005	0.047	0.005	0.003	0.048) $\times 10^{-1}$
5.37 – 5.90	(1.417	0.004	0.038	0.004	0.003	0.038) $\times 10^{-1}$
5.90 – 6.47	(1.165	0.003	0.030	0.003	0.003	0.030) $\times 10^{-1}$
6.47 – 7.09	(9.528	0.028	0.240	0.028	0.027	0.244) $\times 10^{-2}$
7.09 – 7.76	(7.710	0.023	0.191	0.023	0.024	0.194) $\times 10^{-2}$
7.76 – 8.48	(6.240	0.019	0.153	0.018	0.020	0.155) $\times 10^{-2}$
8.48 – 9.26	(5.047	0.015	0.122	0.015	0.017	0.124) $\times 10^{-2}$
9.26 – 10.1	(4.057	0.013	0.097	0.012	0.014	0.099) $\times 10^{-2}$
10.1 – 11.0	(3.282	0.011	0.078	0.010	0.012	0.080) $\times 10^{-2}$
11.0 – 12.0	(2.606	0.009	0.062	0.008	0.010	0.063) $\times 10^{-2}$
12.0 – 13.0	(2.105	0.008	0.050	0.006	0.008	0.051) $\times 10^{-2}$
13.0 – 14.1	(1.688	0.007	0.040	0.005	0.007	0.041) $\times 10^{-2}$
14.1 – 15.3	(1.356	0.006	0.032	0.004	0.006	0.033) $\times 10^{-2}$
15.3 – 16.6	(1.091	0.005	0.026	0.003	0.005	0.026) $\times 10^{-2}$
16.6 – 18.0	(8.596	0.041	0.202	0.024	0.038	0.207) $\times 10^{-3}$
18.0 – 19.5	(6.975	0.035	0.164	0.019	0.031	0.168) $\times 10^{-3}$
19.5 – 21.1	(5.537	0.029	0.131	0.015	0.025	0.134) $\times 10^{-3}$
21.1 – 22.8	(4.408	0.024	0.104	0.011	0.020	0.107) $\times 10^{-3}$
22.8 – 24.7	(3.513	0.019	0.083	0.009	0.017	0.085) $\times 10^{-3}$
24.7 – 26.7	(2.811	0.016	0.067	0.007	0.014	0.069) $\times 10^{-3}$
26.7 – 28.8	(2.271	0.014	0.054	0.006	0.011	0.056) $\times 10^{-3}$
28.8 – 31.1	(1.763	0.011	0.042	0.004	0.009	0.043) $\times 10^{-3}$
31.1 – 33.5	(1.405	0.010	0.034	0.004	0.007	0.035) $\times 10^{-3}$
33.5 – 36.1	(1.140	0.008	0.028	0.003	0.006	0.028) $\times 10^{-3}$
36.1 – 38.9	(9.030	0.070	0.221	0.023	0.047	0.227) $\times 10^{-4}$
38.9 – 41.9	(7.065	0.060	0.175	0.019	0.038	0.180) $\times 10^{-4}$
41.9 – 45.1	(5.715	0.052	0.142	0.016	0.031	0.146) $\times 10^{-4}$
45.1 – 48.5	(4.670	0.046	0.116	0.013	0.026	0.120) $\times 10^{-4}$

Table continued

TABLE SM III – *(Continued).*

Rigidity [GV]	Φ_B	$\sigma_{stat.}$	$\sigma_{acc.}$	$\sigma_{unf.}$	σ_{scale}	$\sigma_{syst.}$	
48.5 – 52.2	(3.626	0.039	0.092	0.011	0.020	0.095)	$\times 10^{-4}$
52.2 – 56.1	(2.937	0.034	0.075	0.009	0.017	0.077)	$\times 10^{-4}$
56.1 – 60.3	(2.342	0.029	0.060	0.008	0.014	0.062)	$\times 10^{-4}$
60.3 – 64.8	(1.857	0.025	0.048	0.007	0.011	0.050)	$\times 10^{-4}$
64.8 – 69.7	(1.479	0.021	0.039	0.006	0.009	0.040)	$\times 10^{-4}$
69.7 – 74.9	(1.182	0.019	0.031	0.005	0.007	0.033)	$\times 10^{-4}$
74.9 – 80.5	(9.654	0.162	0.258	0.043	0.062	0.269)	$\times 10^{-5}$
80.5 – 86.5	(7.699	0.139	0.208	0.037	0.051	0.217)	$\times 10^{-5}$
86.5 – 93.0	(6.299	0.121	0.171	0.033	0.043	0.179)	$\times 10^{-5}$
93.0 – 100	(4.854	0.102	0.134	0.028	0.034	0.141)	$\times 10^{-5}$
100 – 108	(3.787	0.085	0.107	0.024	0.027	0.113)	$\times 10^{-5}$
108 – 116	(2.965	0.075	0.085	0.020	0.022	0.090)	$\times 10^{-5}$
116 – 125	(2.529	0.065	0.072	0.019	0.020	0.077)	$\times 10^{-5}$
125 – 135	(1.883	0.053	0.055	0.015	0.015	0.059)	$\times 10^{-5}$
135 – 147	(1.480	0.043	0.044	0.013	0.012	0.047)	$\times 10^{-5}$
147 – 160	(1.082	0.035	0.033	0.011	0.010	0.036)	$\times 10^{-5}$
160 – 175	(8.733	0.295	0.263	0.096	0.082	0.292)	$\times 10^{-6}$
175 – 192	(7.006	0.248	0.209	0.086	0.071	0.237)	$\times 10^{-6}$
192 – 211	(5.078	0.200	0.154	0.069	0.055	0.178)	$\times 10^{-6}$
211 – 233	(3.805	0.161	0.117	0.058	0.045	0.139)	$\times 10^{-6}$
233 – 259	(2.858	0.128	0.089	0.049	0.037	0.108)	$\times 10^{-6}$
259 – 291	(1.855	0.093	0.061	0.036	0.027	0.076)	$\times 10^{-6}$
291 – 330	(1.423	0.074	0.045	0.032	0.023	0.060)	$\times 10^{-6}$
330 – 379	(8.869	0.517	0.296	0.228	0.164	0.408)	$\times 10^{-7}$
379 – 441	(6.014	0.378	0.194	0.181	0.128	0.295)	$\times 10^{-7}$
441 – 525	(3.866	0.261	0.126	0.138	0.097	0.211)	$\times 10^{-7}$
525 – 660	(2.313	0.159	0.074	0.103	0.071	0.146)	$\times 10^{-7}$
660 – 880	(1.008	0.082	0.033	0.059	0.040	0.079)	$\times 10^{-7}$
880 – 1300	(4.419	0.396	0.144	0.371	0.238	0.464)	$\times 10^{-8}$
1300 – 3300	(0.527	0.143	0.025	0.043	0.035	0.061)	$\times 10^{-8}$

TABLE SM IV: The lithium to carbon flux ratio Li/C as a function of rigidity including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The statistical errors are the sum in quadrature of the relative statistical errors of the fluxes multiplied by the ratio. The systematic errors from the background subtraction, the trigger, and the event reconstruction and selection are likewise added in quadrature. The correlations in the systematic errors from the uncertainty in nuclear interaction cross sections, unfolding, and the absolute rigidity scale between the fluxes have been accounted for in calculating the corresponding systematic errors. The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic uncertainty.

Rigidity [GV]	Li/C	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
1.92 – 2.15	0.1688	0.0011	0.0041	0.0030	0.0000	0.0051
2.15 – 2.40	0.1757	0.0010	0.0044	0.0017	0.0001	0.0048
2.40 – 2.67	0.1825	0.0010	0.0046	0.0014	0.0001	0.0048
2.67 – 2.97	0.1924	0.0009	0.0047	0.0013	0.0001	0.0049
2.97 – 3.29	0.2041	0.0009	0.0049	0.0011	0.0001	0.0050
3.29 – 3.64	0.2112	0.0009	0.0050	0.0010	0.0000	0.0051
3.64 – 4.02	0.2163	0.0009	0.0050	0.0009	0.0001	0.0051
4.02 – 4.43	0.2191	0.0009	0.0050	0.0008	0.0000	0.0051
4.43 – 4.88	0.2200	0.0009	0.0050	0.0007	0.0000	0.0050
4.88 – 5.37	0.2198	0.0008	0.0049	0.0006	0.0001	0.0050
5.37 – 5.90	0.2197	0.0008	0.0049	0.0006	0.0001	0.0049
5.90 – 6.47	0.2177	0.0008	0.0048	0.0006	0.0001	0.0049
6.47 – 7.09	0.2165	0.0008	0.0048	0.0006	0.0001	0.0048
7.09 – 7.76	0.2146	0.0008	0.0047	0.0006	0.0001	0.0048
7.76 – 8.48	0.2112	0.0008	0.0046	0.0006	0.0001	0.0047
8.48 – 9.26	0.2093	0.0008	0.0046	0.0006	0.0001	0.0046
9.26 – 10.1	0.2071	0.0008	0.0046	0.0006	0.0001	0.0046
10.1 – 11.0	0.2038	0.0009	0.0045	0.0006	0.0001	0.0045
11.0 – 12.0	0.1995	0.0009	0.0044	0.0006	0.0001	0.0044
12.0 – 13.0	0.1978	0.0010	0.0043	0.0006	0.0001	0.0044
13.0 – 14.1	0.1924	0.0010	0.0042	0.0006	0.0001	0.0043
14.1 – 15.3	0.1905	0.0010	0.0042	0.0006	0.0001	0.0042
15.3 – 16.6	0.1851	0.0010	0.0041	0.0006	0.0001	0.0041
16.6 – 18.0	0.1796	0.0011	0.0040	0.0006	0.0001	0.0040
18.0 – 19.5	0.1755	0.0011	0.0039	0.0006	0.0001	0.0039
19.5 – 21.1	0.1696	0.0011	0.0038	0.0006	0.0001	0.0038
21.1 – 22.8	0.1664	0.0011	0.0037	0.0006	0.0002	0.0037
22.8 – 24.7	0.1626	0.0011	0.0036	0.0006	0.0002	0.0037
24.7 – 26.7	0.1575	0.0011	0.0035	0.0005	0.0002	0.0036
26.7 – 28.8	0.1542	0.0012	0.0034	0.0005	0.0002	0.0035
28.8 – 31.1	0.1519	0.0012	0.0034	0.0005	0.0002	0.0034
31.1 – 33.5	0.1460	0.0012	0.0033	0.0005	0.0002	0.0033

Table continued

TABLE SM IV – *(Continued).*

Rigidity [GV]	Li/C	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
33.5 – 36.1	0.1412	0.0013	0.0032	0.0005	0.0002	0.0032
36.1 – 38.9	0.1365	0.0013	0.0031	0.0005	0.0002	0.0031
38.9 – 41.9	0.1336	0.0014	0.0030	0.0005	0.0002	0.0031
41.9 – 45.1	0.1305	0.0014	0.0030	0.0005	0.0002	0.0030
45.1 – 48.5	0.1290	0.0015	0.0029	0.0006	0.0002	0.0030
48.5 – 52.2	0.1188	0.0015	0.0027	0.0005	0.0001	0.0028
52.2 – 56.1	0.1180	0.0017	0.0027	0.0005	0.0002	0.0028
56.1 – 60.3	0.1139	0.0017	0.0026	0.0005	0.0002	0.0027
60.3 – 64.8	0.1132	0.0018	0.0026	0.0006	0.0002	0.0027
64.8 – 69.7	0.1090	0.0019	0.0025	0.0005	0.0002	0.0026
69.7 – 74.9	0.1068	0.0020	0.0025	0.0006	0.0002	0.0026
74.9 – 80.5	0.1007	0.0020	0.0024	0.0005	0.0002	0.0024
80.5 – 86.5	0.0989	0.0022	0.0023	0.0006	0.0002	0.0024
86.5 – 93.0	0.0979	0.0023	0.0023	0.0006	0.0002	0.0024
93.0 – 100	0.0911	0.0023	0.0022	0.0005	0.0002	0.0023
100 – 108	0.0897	0.0024	0.0022	0.0006	0.0002	0.0022
108 – 116	0.0842	0.0026	0.0020	0.0005	0.0002	0.0021
116 – 125	0.0799	0.0026	0.0020	0.0005	0.0002	0.0020
125 – 135	0.0806	0.0027	0.0020	0.0006	0.0002	0.0021
135 – 147	0.0831	0.0028	0.0020	0.0006	0.0002	0.0022
147 – 160	0.0830	0.0031	0.0021	0.0007	0.0002	0.0022
160 – 175	0.0804	0.0031	0.0020	0.0007	0.0003	0.0021
175 – 192	0.0745	0.0032	0.0019	0.0007	0.0003	0.0020
192 – 211	0.0726	0.0034	0.0018	0.0008	0.0003	0.0020
211 – 233	0.0678	0.0034	0.0017	0.0008	0.0003	0.0019
233 – 259	0.0720	0.0037	0.0018	0.0009	0.0003	0.0021
259 – 291	0.0587	0.0035	0.0015	0.0008	0.0003	0.0018
291 – 330	0.0607	0.0038	0.0016	0.0010	0.0003	0.0019
330 – 379	0.0646	0.0041	0.0017	0.0012	0.0004	0.0021
379 – 441	0.0695	0.0047	0.0018	0.0015	0.0004	0.0024
441 – 525	0.0451	0.0039	0.0012	0.0011	0.0003	0.0017
525 – 660	0.0551	0.0044	0.0015	0.0017	0.0004	0.0023
660 – 880	0.0506	0.0047	0.0014	0.0021	0.0004	0.0026
880 – 1300	0.0455	0.0050	0.0012	0.0028	0.0003	0.0031
1300 – 3300	0.0440	0.0110	0.0018	0.0032	0.0002	0.0037

TABLE SM V: The beryllium to carbon flux ratio Be/C as a function of rigidity including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The statistical errors are the sum in quadrature of the relative statistical errors of the fluxes multiplied by the ratio. The systematic errors from the background subtraction, the trigger, and the event reconstruction and selection are likewise added in quadrature. The correlations in the systematic errors from the uncertainty in nuclear interaction cross sections, unfolding, and the absolute rigidity scale between the fluxes have been accounted for in calculating the corresponding systematic errors. The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic uncertainty.

Rigidity [GV]	Be/C	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
1.92 – 2.15	0.0936	0.0008	0.0025	0.0017	0.0001	0.0030
2.15 – 2.40	0.0930	0.0007	0.0024	0.0009	0.0000	0.0026
2.40 – 2.67	0.0911	0.0007	0.0023	0.0007	0.0000	0.0024
2.67 – 2.97	0.0945	0.0006	0.0024	0.0006	0.0000	0.0024
2.97 – 3.29	0.1003	0.0006	0.0025	0.0006	0.0000	0.0025
3.29 – 3.64	0.1021	0.0006	0.0025	0.0005	0.0000	0.0025
3.64 – 4.02	0.1047	0.0006	0.0025	0.0004	0.0000	0.0025
4.02 – 4.43	0.1044	0.0006	0.0025	0.0004	0.0000	0.0025
4.43 – 4.88	0.1046	0.0006	0.0025	0.0003	0.0000	0.0025
4.88 – 5.37	0.1047	0.0005	0.0024	0.0003	0.0000	0.0025
5.37 – 5.90	0.1035	0.0005	0.0024	0.0003	0.0000	0.0024
5.90 – 6.47	0.1028	0.0005	0.0024	0.0003	0.0000	0.0024
6.47 – 7.09	0.1015	0.0005	0.0023	0.0003	0.0000	0.0024
7.09 – 7.76	0.1003	0.0005	0.0023	0.0003	0.0000	0.0023
7.76 – 8.48	0.0972	0.0005	0.0022	0.0003	0.0000	0.0022
8.48 – 9.26	0.0972	0.0005	0.0022	0.0003	0.0000	0.0022
9.26 – 10.1	0.0965	0.0006	0.0022	0.0003	0.0000	0.0022
10.1 – 11.0	0.0949	0.0006	0.0022	0.0003	0.0000	0.0022
11.0 – 12.0	0.0923	0.0006	0.0021	0.0003	0.0000	0.0021
12.0 – 13.0	0.0928	0.0006	0.0021	0.0003	0.0000	0.0021
13.0 – 14.1	0.0906	0.0007	0.0021	0.0003	0.0000	0.0021
14.1 – 15.3	0.0888	0.0007	0.0020	0.0002	0.0000	0.0021
15.3 – 16.6	0.0870	0.0007	0.0020	0.0002	0.0001	0.0020
16.6 – 18.0	0.0871	0.0007	0.0020	0.0002	0.0001	0.0020
18.0 – 19.5	0.0837	0.0007	0.0019	0.0002	0.0001	0.0020
19.5 – 21.1	0.0824	0.0008	0.0019	0.0002	0.0001	0.0019
21.1 – 22.8	0.0815	0.0008	0.0019	0.0002	0.0001	0.0019
22.8 – 24.7	0.0786	0.0008	0.0018	0.0002	0.0001	0.0019
24.7 – 26.7	0.0759	0.0008	0.0018	0.0002	0.0001	0.0018
26.7 – 28.8	0.0747	0.0008	0.0018	0.0002	0.0001	0.0018
28.8 – 31.1	0.0738	0.0008	0.0018	0.0002	0.0001	0.0018
31.1 – 33.5	0.0732	0.0009	0.0017	0.0002	0.0001	0.0018

Table continued

TABLE SM V – *(Continued).*

Rigidity [GV]	Be/C	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
33.5 – 36.1	0.0704	0.0009	0.0017	0.0002	0.0001	0.0017
36.1 – 38.9	0.0691	0.0009	0.0017	0.0002	0.0001	0.0017
38.9 – 41.9	0.0671	0.0010	0.0016	0.0003	0.0001	0.0017
41.9 – 45.1	0.0645	0.0010	0.0016	0.0003	0.0001	0.0016
45.1 – 48.5	0.0644	0.0011	0.0016	0.0003	0.0001	0.0016
48.5 – 52.2	0.0609	0.0011	0.0015	0.0003	0.0001	0.0015
52.2 – 56.1	0.0599	0.0012	0.0015	0.0003	0.0001	0.0015
56.1 – 60.3	0.0583	0.0012	0.0015	0.0003	0.0001	0.0015
60.3 – 64.8	0.0580	0.0013	0.0015	0.0003	0.0001	0.0015
64.8 – 69.7	0.0542	0.0013	0.0014	0.0003	0.0001	0.0014
69.7 – 74.9	0.0553	0.0014	0.0014	0.0003	0.0001	0.0015
74.9 – 80.5	0.0505	0.0015	0.0013	0.0003	0.0001	0.0014
80.5 – 86.5	0.0522	0.0016	0.0014	0.0003	0.0001	0.0014
86.5 – 93.0	0.0528	0.0017	0.0014	0.0003	0.0001	0.0014
93.0 – 100	0.0503	0.0018	0.0014	0.0003	0.0001	0.0014
100 – 108	0.0469	0.0017	0.0013	0.0003	0.0001	0.0013
108 – 116	0.0469	0.0019	0.0013	0.0003	0.0001	0.0013
116 – 125	0.0442	0.0019	0.0013	0.0003	0.0001	0.0013
125 – 135	0.0394	0.0019	0.0012	0.0003	0.0001	0.0012
135 – 147	0.0436	0.0021	0.0013	0.0004	0.0001	0.0013
147 – 160	0.0386	0.0021	0.0011	0.0004	0.0001	0.0012
160 – 175	0.0415	0.0023	0.0012	0.0004	0.0001	0.0013
175 – 192	0.0344	0.0022	0.0011	0.0004	0.0001	0.0011
192 – 211	0.0335	0.0023	0.0010	0.0004	0.0001	0.0011
211 – 233	0.0385	0.0026	0.0012	0.0005	0.0002	0.0013
233 – 259	0.0354	0.0026	0.0011	0.0006	0.0002	0.0012
259 – 291	0.0343	0.0027	0.0011	0.0006	0.0002	0.0013
291 – 330	0.0311	0.0027	0.0010	0.0007	0.0002	0.0012
330 – 379	0.0277	0.0027	0.0009	0.0007	0.0002	0.0012
379 – 441	0.0335	0.0033	0.0011	0.0010	0.0003	0.0015
441 – 525	0.0252	0.0030	0.0009	0.0009	0.0003	0.0013
525 – 660	0.0271	0.0032	0.0009	0.0013	0.0003	0.0016
660 – 880	0.0254	0.0034	0.0009	0.0017	0.0004	0.0020
880 – 1300	0.0207	0.0034	0.0008	0.0022	0.0004	0.0024
1300 – 3300	0.0118	0.0061	0.0007	0.0012	0.0003	0.0014

TABLE SM VI: The boron to carbon flux ratio B/C as a function of rigidity including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The statistical errors are the sum in quadrature of the relative statistical errors of the fluxes multiplied by the ratio. The systematic errors from the background subtraction, the trigger, and the event reconstruction and selection are likewise added in quadrature. The correlations in the systematic errors from the uncertainty in nuclear interaction cross sections, unfolding, and the absolute rigidity scale between the fluxes have been accounted for in calculating the corresponding systematic errors. The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic uncertainty.

Rigidity [GV]	B/C	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
1.92 – 2.15	0.2880	0.0016	0.0151	0.0052	0.0002	0.0160
2.15 – 2.40	0.2947	0.0014	0.0138	0.0031	0.0002	0.0142
2.40 – 2.67	0.3033	0.0013	0.0128	0.0026	0.0002	0.0131
2.67 – 2.97	0.3086	0.0013	0.0118	0.0022	0.0002	0.0120
2.97 – 3.29	0.3173	0.0012	0.0111	0.0019	0.0001	0.0112
3.29 – 3.64	0.3241	0.0012	0.0104	0.0017	0.0001	0.0105
3.64 – 4.02	0.3296	0.0012	0.0098	0.0015	0.0000	0.0099
4.02 – 4.43	0.3285	0.0012	0.0091	0.0013	0.0001	0.0092
4.43 – 4.88	0.3221	0.0011	0.0084	0.0011	0.0001	0.0085
4.88 – 5.37	0.3200	0.0010	0.0079	0.0010	0.0001	0.0080
5.37 – 5.90	0.3145	0.0010	0.0075	0.0009	0.0002	0.0075
5.90 – 6.47	0.3087	0.0010	0.0071	0.0008	0.0002	0.0071
6.47 – 7.09	0.3032	0.0010	0.0068	0.0008	0.0002	0.0068
7.09 – 7.76	0.2977	0.0010	0.0065	0.0008	0.0001	0.0065
7.76 – 8.48	0.2917	0.0010	0.0063	0.0008	0.0001	0.0063
8.48 – 9.26	0.2880	0.0010	0.0061	0.0007	0.0001	0.0061
9.26 – 10.1	0.2834	0.0010	0.0059	0.0007	0.0001	0.0060
10.1 – 11.0	0.2811	0.0011	0.0058	0.0007	0.0001	0.0059
11.0 – 12.0	0.2748	0.0011	0.0056	0.0007	0.0001	0.0057
12.0 – 13.0	0.2709	0.0012	0.0055	0.0007	0.0001	0.0056
13.0 – 14.1	0.2647	0.0012	0.0054	0.0007	0.0001	0.0054
14.1 – 15.3	0.2602	0.0013	0.0053	0.0007	0.0002	0.0053
15.3 – 16.6	0.2555	0.0013	0.0052	0.0007	0.0002	0.0052
16.6 – 18.0	0.2471	0.0013	0.0050	0.0006	0.0002	0.0051
18.0 – 19.5	0.2449	0.0014	0.0050	0.0006	0.0002	0.0050
19.5 – 21.1	0.2362	0.0014	0.0049	0.0006	0.0002	0.0049
21.1 – 22.8	0.2302	0.0014	0.0048	0.0006	0.0002	0.0048
22.8 – 24.7	0.2247	0.0014	0.0047	0.0006	0.0002	0.0047
24.7 – 26.7	0.2208	0.0014	0.0046	0.0006	0.0002	0.0047
26.7 – 28.8	0.2182	0.0015	0.0046	0.0006	0.0002	0.0046
28.8 – 31.1	0.2071	0.0015	0.0044	0.0006	0.0002	0.0045
31.1 – 33.5	0.2012	0.0015	0.0043	0.0006	0.0002	0.0044

Table continued

TABLE SM VI – *(Continued).*

Rigidity [GV]	B/C	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
33.5 – 36.1	0.1985	0.0016	0.0043	0.0007	0.0002	0.0044
36.1 – 38.9	0.1915	0.0016	0.0042	0.0007	0.0002	0.0043
38.9 – 41.9	0.1818	0.0017	0.0041	0.0007	0.0002	0.0041
41.9 – 45.1	0.1811	0.0018	0.0041	0.0007	0.0002	0.0041
45.1 – 48.5	0.1802	0.0019	0.0041	0.0007	0.0002	0.0041
48.5 – 52.2	0.1673	0.0019	0.0039	0.0007	0.0002	0.0039
52.2 – 56.1	0.1664	0.0021	0.0039	0.0007	0.0002	0.0039
56.1 – 60.3	0.1606	0.0022	0.0038	0.0007	0.0002	0.0039
60.3 – 64.8	0.1555	0.0023	0.0037	0.0007	0.0002	0.0038
64.8 – 69.7	0.1521	0.0024	0.0037	0.0007	0.0002	0.0038
69.7 – 74.9	0.1477	0.0025	0.0036	0.0007	0.0002	0.0037
74.9 – 80.5	0.1456	0.0026	0.0036	0.0007	0.0002	0.0037
80.5 – 86.5	0.1428	0.0028	0.0036	0.0008	0.0002	0.0037
86.5 – 93.0	0.1407	0.0029	0.0036	0.0008	0.0003	0.0037
93.0 – 100	0.1337	0.0030	0.0035	0.0008	0.0003	0.0036
100 – 108	0.1267	0.0030	0.0034	0.0008	0.0003	0.0035
108 – 116	0.1229	0.0033	0.0033	0.0008	0.0003	0.0034
116 – 125	0.1261	0.0035	0.0034	0.0009	0.0003	0.0035
125 – 135	0.1175	0.0035	0.0033	0.0009	0.0003	0.0034
135 – 147	0.1150	0.0035	0.0032	0.0009	0.0003	0.0034
147 – 160	0.1079	0.0037	0.0031	0.0009	0.0003	0.0033
160 – 175	0.1097	0.0039	0.0032	0.0011	0.0003	0.0033
175 – 192	0.1119	0.0042	0.0032	0.0012	0.0004	0.0034
192 – 211	0.1066	0.0044	0.0031	0.0013	0.0004	0.0034
211 – 233	0.1015	0.0045	0.0030	0.0013	0.0004	0.0033
233 – 259	0.0997	0.0047	0.0030	0.0015	0.0004	0.0034
259 – 291	0.0852	0.0044	0.0027	0.0014	0.0004	0.0031
291 – 330	0.0927	0.0050	0.0028	0.0018	0.0005	0.0034
330 – 379	0.0800	0.0049	0.0026	0.0018	0.0005	0.0032
379 – 441	0.0842	0.0055	0.0026	0.0022	0.0006	0.0035
441 – 525	0.0791	0.0055	0.0025	0.0025	0.0006	0.0036
525 – 660	0.0810	0.0058	0.0025	0.0031	0.0007	0.0041
660 – 880	0.0712	0.0060	0.0023	0.0036	0.0007	0.0044
880 – 1300	0.0733	0.0068	0.0023	0.0053	0.0007	0.0059
1300 – 3300	0.0446	0.0124	0.0021	0.0032	0.0005	0.0039

TABLE SM VII: The lithium to oxygen flux ratio Li/O as a function of rigidity including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The statistical errors are the sum in quadrature of the relative statistical errors of the fluxes multiplied by the ratio. The systematic errors from the background subtraction, the trigger, and the event reconstruction and selection are likewise added in quadrature. The correlations in the systematic errors from the uncertainty in nuclear interaction cross sections, unfolding, and the absolute rigidity scale between the fluxes have been accounted for in calculating the corresponding systematic errors. The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic uncertainty.

Rigidity [GV]	Li/O	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
2.15 – 2.40	0.1831	0.0011	0.0050	0.0020	0.0001	0.0054
2.40 – 2.67	0.1962	0.0011	0.0052	0.0017	0.0001	0.0054
2.67 – 2.97	0.2071	0.0010	0.0052	0.0016	0.0001	0.0054
2.97 – 3.29	0.2156	0.0010	0.0052	0.0014	0.0001	0.0054
3.29 – 3.64	0.2216	0.0010	0.0052	0.0012	0.0000	0.0053
3.64 – 4.02	0.2252	0.0010	0.0052	0.0010	0.0000	0.0053
4.02 – 4.43	0.2295	0.0010	0.0052	0.0009	0.0000	0.0053
4.43 – 4.88	0.2309	0.0009	0.0052	0.0008	0.0001	0.0052
4.88 – 5.37	0.2321	0.0009	0.0052	0.0007	0.0001	0.0052
5.37 – 5.90	0.2319	0.0009	0.0051	0.0007	0.0001	0.0052
5.90 – 6.47	0.2302	0.0009	0.0051	0.0006	0.0001	0.0051
6.47 – 7.09	0.2293	0.0009	0.0051	0.0006	0.0001	0.0051
7.09 – 7.76	0.2268	0.0009	0.0050	0.0006	0.0001	0.0051
7.76 – 8.48	0.2224	0.0009	0.0049	0.0006	0.0001	0.0050
8.48 – 9.26	0.2187	0.0009	0.0049	0.0006	0.0001	0.0049
9.26 – 10.1	0.2149	0.0009	0.0048	0.0006	0.0001	0.0048
10.1 – 11.0	0.2104	0.0009	0.0047	0.0007	0.0001	0.0047
11.0 – 12.0	0.2037	0.0009	0.0046	0.0006	0.0002	0.0046
12.0 – 13.0	0.2004	0.0010	0.0045	0.0006	0.0002	0.0045
13.0 – 14.1	0.1936	0.0010	0.0043	0.0006	0.0002	0.0044
14.1 – 15.3	0.1916	0.0010	0.0043	0.0006	0.0002	0.0044
15.3 – 16.6	0.1845	0.0011	0.0042	0.0006	0.0002	0.0042
16.6 – 18.0	0.1777	0.0011	0.0040	0.0006	0.0002	0.0041
18.0 – 19.5	0.1726	0.0011	0.0039	0.0006	0.0002	0.0040
19.5 – 21.1	0.1669	0.0011	0.0038	0.0006	0.0002	0.0038
21.1 – 22.8	0.1630	0.0011	0.0037	0.0005	0.0002	0.0038
22.8 – 24.7	0.1576	0.0011	0.0036	0.0005	0.0002	0.0036
24.7 – 26.7	0.1521	0.0011	0.0035	0.0005	0.0002	0.0035
26.7 – 28.8	0.1484	0.0011	0.0034	0.0005	0.0002	0.0035
28.8 – 31.1	0.1448	0.0011	0.0033	0.0005	0.0002	0.0034
31.1 – 33.5	0.1384	0.0012	0.0032	0.0005	0.0002	0.0032
33.5 – 36.1	0.1336	0.0012	0.0031	0.0005	0.0002	0.0032

Table continued

TABLE SM VII – *(Continued).*

Rigidity [GV]	Li/O	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
36.1 – 38.9	0.1290	0.0012	0.0030	0.0005	0.0002	0.0031
38.9 – 41.9	0.1272	0.0013	0.0030	0.0005	0.0002	0.0030
41.9 – 45.1	0.1221	0.0014	0.0029	0.0005	0.0002	0.0029
45.1 – 48.5	0.1201	0.0014	0.0029	0.0005	0.0002	0.0029
48.5 – 52.2	0.1113	0.0014	0.0027	0.0005	0.0002	0.0027
52.2 – 56.1	0.1091	0.0015	0.0026	0.0005	0.0002	0.0027
56.1 – 60.3	0.1066	0.0016	0.0026	0.0005	0.0002	0.0026
60.3 – 64.8	0.1048	0.0017	0.0026	0.0005	0.0002	0.0026
64.8 – 69.7	0.0996	0.0017	0.0025	0.0005	0.0002	0.0025
69.7 – 74.9	0.0992	0.0019	0.0025	0.0005	0.0002	0.0025
74.9 – 80.5	0.0932	0.0019	0.0024	0.0005	0.0002	0.0024
80.5 – 86.5	0.0899	0.0020	0.0023	0.0005	0.0002	0.0023
86.5 – 93.0	0.0909	0.0021	0.0023	0.0005	0.0002	0.0024
93.0 – 100	0.0839	0.0022	0.0022	0.0005	0.0002	0.0022
100 – 108	0.0827	0.0022	0.0022	0.0005	0.0002	0.0022
108 – 116	0.0758	0.0023	0.0020	0.0005	0.0002	0.0021
116 – 125	0.0734	0.0024	0.0020	0.0005	0.0002	0.0020
125 – 135	0.0725	0.0025	0.0020	0.0005	0.0002	0.0020
135 – 147	0.0738	0.0025	0.0020	0.0005	0.0002	0.0021
147 – 160	0.0742	0.0028	0.0021	0.0006	0.0002	0.0022
160 – 175	0.0719	0.0028	0.0020	0.0006	0.0002	0.0021
175 – 192	0.0663	0.0029	0.0019	0.0006	0.0002	0.0020
192 – 211	0.0620	0.0029	0.0018	0.0006	0.0002	0.0019
211 – 233	0.0607	0.0031	0.0018	0.0007	0.0002	0.0019
233 – 259	0.0651	0.0034	0.0019	0.0008	0.0003	0.0021
259 – 291	0.0539	0.0032	0.0016	0.0008	0.0002	0.0018
291 – 330	0.0547	0.0034	0.0017	0.0009	0.0003	0.0019
330 – 379	0.0586	0.0037	0.0018	0.0011	0.0003	0.0022
379 – 441	0.0604	0.0041	0.0019	0.0013	0.0003	0.0024
441 – 525	0.0419	0.0036	0.0014	0.0011	0.0002	0.0018
525 – 660	0.0524	0.0043	0.0018	0.0017	0.0003	0.0025
660 – 880	0.0458	0.0043	0.0016	0.0020	0.0003	0.0025
880 – 1300	0.0406	0.0044	0.0015	0.0025	0.0002	0.0029
1300 – 3300	0.0387	0.0097	0.0019	0.0028	0.0002	0.0034

TABLE SM VIII: The beryllium to oxygen flux ratio Be/O as a function of rigidity including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The statistical errors are the sum in quadrature of the relative statistical errors of the fluxes multiplied by the ratio. The systematic errors from the background subtraction, the trigger, and the event reconstruction and selection are likewise added in quadrature. The correlations in the systematic errors from the uncertainty in nuclear interaction cross sections, unfolding, and the absolute rigidity scale between the fluxes have been accounted for in calculating the corresponding systematic errors. The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic uncertainty.

Rigidity [GV]	Be/O	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
2.15 – 2.40	0.0969	0.0008	0.0026	0.0010	0.0000	0.0028
2.40 – 2.67	0.0979	0.0007	0.0025	0.0009	0.0000	0.0026
2.67 – 2.97	0.1017	0.0007	0.0025	0.0008	0.0000	0.0026
2.97 – 3.29	0.1059	0.0007	0.0025	0.0007	0.0000	0.0026
3.29 – 3.64	0.1071	0.0006	0.0026	0.0006	0.0000	0.0026
3.64 – 4.02	0.1090	0.0006	0.0026	0.0005	0.0000	0.0026
4.02 – 4.43	0.1094	0.0006	0.0026	0.0004	0.0000	0.0026
4.43 – 4.88	0.1098	0.0006	0.0026	0.0004	0.0000	0.0026
4.88 – 5.37	0.1106	0.0006	0.0026	0.0004	0.0000	0.0026
5.37 – 5.90	0.1092	0.0006	0.0026	0.0003	0.0000	0.0026
5.90 – 6.47	0.1086	0.0006	0.0026	0.0003	0.0000	0.0026
6.47 – 7.09	0.1075	0.0006	0.0025	0.0003	0.0000	0.0026
7.09 – 7.76	0.1060	0.0006	0.0025	0.0003	0.0001	0.0025
7.76 – 8.48	0.1024	0.0006	0.0024	0.0003	0.0001	0.0024
8.48 – 9.26	0.1016	0.0006	0.0024	0.0003	0.0001	0.0024
9.26 – 10.1	0.1001	0.0006	0.0024	0.0003	0.0001	0.0024
10.1 – 11.0	0.0980	0.0006	0.0023	0.0003	0.0001	0.0023
11.0 – 12.0	0.0943	0.0006	0.0022	0.0003	0.0001	0.0023
12.0 – 13.0	0.0940	0.0007	0.0022	0.0003	0.0001	0.0023
13.0 – 14.1	0.0912	0.0007	0.0022	0.0003	0.0001	0.0022
14.1 – 15.3	0.0893	0.0007	0.0021	0.0002	0.0001	0.0022
15.3 – 16.6	0.0867	0.0007	0.0021	0.0002	0.0001	0.0021
16.6 – 18.0	0.0861	0.0007	0.0021	0.0002	0.0001	0.0021
18.0 – 19.5	0.0824	0.0007	0.0020	0.0002	0.0001	0.0020
19.5 – 21.1	0.0811	0.0007	0.0020	0.0002	0.0001	0.0020
21.1 – 22.8	0.0798	0.0008	0.0019	0.0002	0.0001	0.0020
22.8 – 24.7	0.0762	0.0007	0.0019	0.0002	0.0001	0.0019
24.7 – 26.7	0.0733	0.0007	0.0018	0.0002	0.0001	0.0018
26.7 – 28.8	0.0719	0.0008	0.0018	0.0002	0.0001	0.0018
28.8 – 31.1	0.0704	0.0008	0.0017	0.0002	0.0001	0.0018
31.1 – 33.5	0.0694	0.0008	0.0017	0.0002	0.0001	0.0017
33.5 – 36.1	0.0667	0.0008	0.0017	0.0002	0.0001	0.0017

Table continued

TABLE SM VIII – *(Continued).*

Rigidity [GV]	Be/O	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
36.1 – 38.9	0.0653	0.0009	0.0017	0.0002	0.0001	0.0017
38.9 – 41.9	0.0639	0.0009	0.0016	0.0002	0.0001	0.0017
41.9 – 45.1	0.0603	0.0009	0.0016	0.0002	0.0001	0.0016
45.1 – 48.5	0.0600	0.0010	0.0016	0.0002	0.0001	0.0016
48.5 – 52.2	0.0571	0.0010	0.0015	0.0002	0.0001	0.0015
52.2 – 56.1	0.0554	0.0011	0.0015	0.0002	0.0001	0.0015
56.1 – 60.3	0.0546	0.0012	0.0015	0.0002	0.0001	0.0015
60.3 – 64.8	0.0537	0.0012	0.0015	0.0002	0.0001	0.0015
64.8 – 69.7	0.0496	0.0012	0.0014	0.0002	0.0001	0.0014
69.7 – 74.9	0.0514	0.0013	0.0014	0.0002	0.0001	0.0015
74.9 – 80.5	0.0468	0.0014	0.0013	0.0002	0.0001	0.0014
80.5 – 86.5	0.0474	0.0014	0.0014	0.0002	0.0001	0.0014
86.5 – 93.0	0.0490	0.0016	0.0014	0.0003	0.0001	0.0014
93.0 – 100	0.0463	0.0016	0.0014	0.0003	0.0001	0.0014
100 – 108	0.0433	0.0016	0.0013	0.0003	0.0001	0.0013
108 – 116	0.0422	0.0017	0.0013	0.0003	0.0001	0.0013
116 – 125	0.0406	0.0018	0.0013	0.0003	0.0001	0.0013
125 – 135	0.0354	0.0017	0.0011	0.0003	0.0001	0.0012
135 – 147	0.0387	0.0018	0.0012	0.0003	0.0001	0.0013
147 – 160	0.0345	0.0019	0.0011	0.0003	0.0001	0.0012
160 – 175	0.0372	0.0020	0.0012	0.0004	0.0001	0.0013
175 – 192	0.0306	0.0019	0.0010	0.0003	0.0001	0.0011
192 – 211	0.0286	0.0020	0.0010	0.0004	0.0001	0.0011
211 – 233	0.0344	0.0024	0.0012	0.0005	0.0002	0.0013
233 – 259	0.0320	0.0024	0.0011	0.0005	0.0002	0.0012
259 – 291	0.0315	0.0025	0.0011	0.0006	0.0002	0.0013
291 – 330	0.0281	0.0025	0.0010	0.0006	0.0002	0.0012
330 – 379	0.0252	0.0025	0.0009	0.0006	0.0002	0.0011
379 – 441	0.0291	0.0029	0.0011	0.0009	0.0002	0.0014
441 – 525	0.0234	0.0028	0.0009	0.0008	0.0002	0.0013
525 – 660	0.0258	0.0030	0.0010	0.0012	0.0003	0.0016
660 – 880	0.0231	0.0031	0.0009	0.0015	0.0003	0.0018
880 – 1300	0.0185	0.0031	0.0008	0.0019	0.0003	0.0021
1300 – 3300	0.0104	0.0053	0.0007	0.0010	0.0002	0.0013

TABLE SM IX: The boron to oxygen flux ratio B/O as a function of rigidity including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The statistical errors are the sum in quadrature of the relative statistical errors of the fluxes multiplied by the ratio. The systematic errors from the background subtraction, the trigger, and the event reconstruction and selection are likewise added in quadrature. The correlations in the systematic errors from the uncertainty in nuclear interaction cross sections, unfolding, and the absolute rigidity scale between the fluxes have been accounted for in calculating the corresponding systematic errors. The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic uncertainty.

Rigidity [GV]	B/O	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
2.15 – 2.40	0.3071	0.0015	0.0143	0.0034	0.0003	0.0147
2.40 – 2.67	0.3261	0.0015	0.0137	0.0030	0.0002	0.0140
2.67 – 2.97	0.3322	0.0014	0.0126	0.0026	0.0001	0.0129
2.97 – 3.29	0.3352	0.0013	0.0117	0.0022	0.0001	0.0119
3.29 – 3.64	0.3400	0.0013	0.0109	0.0019	0.0000	0.0111
3.64 – 4.02	0.3430	0.0013	0.0103	0.0017	0.0001	0.0104
4.02 – 4.43	0.3442	0.0012	0.0097	0.0014	0.0001	0.0098
4.43 – 4.88	0.3381	0.0012	0.0090	0.0012	0.0002	0.0091
4.88 – 5.37	0.3380	0.0011	0.0086	0.0011	0.0002	0.0087
5.37 – 5.90	0.3320	0.0011	0.0082	0.0010	0.0002	0.0083
5.90 – 6.47	0.3263	0.0011	0.0078	0.0009	0.0002	0.0079
6.47 – 7.09	0.3212	0.0011	0.0075	0.0009	0.0002	0.0076
7.09 – 7.76	0.3146	0.0011	0.0073	0.0008	0.0002	0.0073
7.76 – 8.48	0.3071	0.0011	0.0070	0.0008	0.0002	0.0070
8.48 – 9.26	0.3010	0.0011	0.0068	0.0008	0.0002	0.0068
9.26 – 10.1	0.2940	0.0011	0.0066	0.0008	0.0002	0.0066
10.1 – 11.0	0.2902	0.0011	0.0064	0.0008	0.0002	0.0065
11.0 – 12.0	0.2807	0.0011	0.0062	0.0007	0.0002	0.0062
12.0 – 13.0	0.2745	0.0012	0.0060	0.0007	0.0002	0.0061
13.0 – 14.1	0.2664	0.0012	0.0059	0.0007	0.0002	0.0059
14.1 – 15.3	0.2618	0.0013	0.0058	0.0007	0.0002	0.0058
15.3 – 16.6	0.2545	0.0013	0.0056	0.0007	0.0002	0.0057
16.6 – 18.0	0.2443	0.0013	0.0054	0.0006	0.0002	0.0054
18.0 – 19.5	0.2409	0.0014	0.0053	0.0006	0.0002	0.0054
19.5 – 21.1	0.2325	0.0014	0.0052	0.0006	0.0002	0.0052
21.1 – 22.8	0.2255	0.0014	0.0051	0.0006	0.0002	0.0051
22.8 – 24.7	0.2178	0.0014	0.0049	0.0006	0.0002	0.0049
24.7 – 26.7	0.2132	0.0014	0.0048	0.0006	0.0002	0.0049
26.7 – 28.8	0.2100	0.0014	0.0048	0.0006	0.0002	0.0048
28.8 – 31.1	0.1975	0.0014	0.0046	0.0006	0.0002	0.0046
31.1 – 33.5	0.1907	0.0015	0.0044	0.0006	0.0002	0.0045
33.5 – 36.1	0.1879	0.0015	0.0044	0.0006	0.0002	0.0045

Table continued

TABLE SM IX – *(Continued).*

Rigidity [GV]	B/O	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
36.1 – 38.9	0.1810	0.0016	0.0043	0.0006	0.0002	0.0043
38.9 – 41.9	0.1732	0.0016	0.0042	0.0006	0.0002	0.0042
41.9 – 45.1	0.1694	0.0017	0.0041	0.0006	0.0002	0.0042
45.1 – 48.5	0.1678	0.0018	0.0041	0.0006	0.0002	0.0042
48.5 – 52.2	0.1567	0.0018	0.0039	0.0006	0.0002	0.0040
52.2 – 56.1	0.1539	0.0019	0.0039	0.0006	0.0002	0.0040
56.1 – 60.3	0.1504	0.0020	0.0039	0.0006	0.0002	0.0039
60.3 – 64.8	0.1439	0.0021	0.0038	0.0006	0.0002	0.0038
64.8 – 69.7	0.1390	0.0022	0.0037	0.0006	0.0002	0.0038
69.7 – 74.9	0.1373	0.0023	0.0037	0.0006	0.0002	0.0038
74.9 – 80.5	0.1348	0.0024	0.0037	0.0006	0.0002	0.0037
80.5 – 86.5	0.1298	0.0025	0.0036	0.0006	0.0002	0.0037
86.5 – 93.0	0.1306	0.0027	0.0037	0.0007	0.0003	0.0037
93.0 – 100	0.1231	0.0028	0.0035	0.0007	0.0003	0.0036
100 – 108	0.1168	0.0028	0.0034	0.0007	0.0003	0.0035
108 – 116	0.1108	0.0030	0.0033	0.0007	0.0003	0.0034
116 – 125	0.1159	0.0032	0.0035	0.0008	0.0003	0.0036
125 – 135	0.1057	0.0032	0.0033	0.0008	0.0003	0.0034
135 – 147	0.1021	0.0032	0.0032	0.0008	0.0003	0.0033
147 – 160	0.0964	0.0033	0.0031	0.0008	0.0003	0.0032
160 – 175	0.0981	0.0035	0.0032	0.0009	0.0003	0.0033
175 – 192	0.0996	0.0037	0.0032	0.0011	0.0003	0.0034
192 – 211	0.0910	0.0038	0.0030	0.0011	0.0003	0.0032
211 – 233	0.0908	0.0040	0.0031	0.0012	0.0004	0.0033
233 – 259	0.0902	0.0043	0.0031	0.0013	0.0004	0.0034
259 – 291	0.0783	0.0041	0.0028	0.0013	0.0004	0.0032
291 – 330	0.0835	0.0045	0.0030	0.0016	0.0004	0.0034
330 – 379	0.0725	0.0044	0.0027	0.0016	0.0004	0.0032
379 – 441	0.0731	0.0048	0.0027	0.0019	0.0004	0.0033
441 – 525	0.0735	0.0052	0.0028	0.0023	0.0005	0.0036
525 – 660	0.0771	0.0056	0.0029	0.0030	0.0005	0.0042
660 – 880	0.0645	0.0055	0.0026	0.0033	0.0005	0.0042
880 – 1300	0.0655	0.0061	0.0026	0.0048	0.0006	0.0055
1300 – 3300	0.0393	0.0110	0.0022	0.0028	0.0004	0.0036

TABLE SM X: The lithium to boron flux ratio Li/B as a function of rigidity including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The statistical errors are the sum in quadrature of the relative statistical errors of the fluxes multiplied by the ratio. The systematic errors from the background subtraction, the trigger, and the event reconstruction and selection are likewise added in quadrature. The correlations in the systematic errors from the uncertainty in nuclear interaction cross sections, unfolding, and the absolute rigidity scale between the fluxes have been accounted for in calculating the corresponding systematic errors. The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic uncertainty.

Rigidity [GV]	Li/B	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
2.15 – 2.40	0.5963	0.0041	0.0171	0.0050	0.0001	0.0179
2.40 – 2.67	0.6017	0.0037	0.0171	0.0042	0.0000	0.0176
2.67 – 2.97	0.6234	0.0035	0.0173	0.0036	0.0001	0.0177
2.97 – 3.29	0.6432	0.0034	0.0175	0.0032	0.0001	0.0178
3.29 – 3.64	0.6517	0.0033	0.0174	0.0028	0.0002	0.0176
3.64 – 4.02	0.6564	0.0032	0.0173	0.0025	0.0002	0.0175
4.02 – 4.43	0.6669	0.0032	0.0174	0.0022	0.0002	0.0175
4.43 – 4.88	0.6829	0.0031	0.0177	0.0021	0.0001	0.0178
4.88 – 5.37	0.6869	0.0030	0.0177	0.0020	0.0001	0.0178
5.37 – 5.90	0.6986	0.0031	0.0179	0.0020	0.0001	0.0180
5.90 – 6.47	0.7054	0.0031	0.0180	0.0020	0.0001	0.0182
6.47 – 7.09	0.7140	0.0032	0.0182	0.0021	0.0001	0.0184
7.09 – 7.76	0.7209	0.0032	0.0184	0.0022	0.0001	0.0185
7.76 – 8.48	0.7242	0.0033	0.0185	0.0022	0.0001	0.0186
8.48 – 9.26	0.7266	0.0034	0.0186	0.0023	0.0001	0.0187
9.26 – 10.1	0.7308	0.0035	0.0187	0.0024	0.0000	0.0188
10.1 – 11.0	0.7251	0.0037	0.0185	0.0024	0.0000	0.0187
11.0 – 12.0	0.7259	0.0039	0.0186	0.0025	0.0000	0.0187
12.0 – 13.0	0.7303	0.0043	0.0187	0.0025	0.0000	0.0189
13.0 – 14.1	0.7267	0.0045	0.0187	0.0025	0.0000	0.0188
14.1 – 15.3	0.7321	0.0048	0.0188	0.0025	0.0000	0.0190
15.3 – 16.6	0.7247	0.0050	0.0187	0.0025	0.0000	0.0189
16.6 – 18.0	0.7271	0.0053	0.0188	0.0025	0.0000	0.0190
18.0 – 19.5	0.7165	0.0054	0.0186	0.0024	0.0000	0.0187
19.5 – 21.1	0.7179	0.0057	0.0187	0.0024	0.0000	0.0189
21.1 – 22.8	0.7229	0.0060	0.0189	0.0024	0.0000	0.0191
22.8 – 24.7	0.7236	0.0060	0.0190	0.0024	0.0000	0.0192
24.7 – 26.7	0.7133	0.0063	0.0188	0.0024	0.0000	0.0190
26.7 – 28.8	0.7067	0.0065	0.0187	0.0023	0.0000	0.0188
28.8 – 31.1	0.7334	0.0071	0.0195	0.0024	0.0000	0.0197
31.1 – 33.5	0.7258	0.0075	0.0195	0.0024	0.0000	0.0196
33.5 – 36.1	0.7113	0.0078	0.0191	0.0024	0.0000	0.0193

Table continued

TABLE SM X – *(Continued).*

Rigidity [GV]	Li/B	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
36.1 – 38.9	0.7127	0.0084	0.0193	0.0024	0.0000	0.0195
38.9 – 41.9	0.7347	0.0094	0.0201	0.0025	0.0000	0.0203
41.9 – 45.1	0.7207	0.0100	0.0198	0.0025	0.0000	0.0200
45.1 – 48.5	0.7156	0.0106	0.0197	0.0025	0.0000	0.0199
48.5 – 52.2	0.7101	0.0115	0.0200	0.0026	0.0000	0.0201
52.2 – 56.1	0.7093	0.0124	0.0200	0.0027	0.0000	0.0202
56.1 – 60.3	0.7089	0.0134	0.0202	0.0028	0.0000	0.0204
60.3 – 64.8	0.7285	0.0148	0.0210	0.0030	0.0000	0.0212
64.8 – 69.7	0.7165	0.0157	0.0208	0.0031	0.0000	0.0211
69.7 – 74.9	0.7228	0.0171	0.0212	0.0033	0.0001	0.0215
74.9 – 80.5	0.6913	0.0176	0.0205	0.0033	0.0001	0.0208
80.5 – 86.5	0.6926	0.0191	0.0207	0.0035	0.0001	0.0210
86.5 – 93.0	0.6960	0.0203	0.0210	0.0038	0.0001	0.0213
93.0 – 100	0.6813	0.0220	0.0209	0.0040	0.0001	0.0213
100 – 108	0.7081	0.0239	0.0222	0.0044	0.0001	0.0226
108 – 116	0.6846	0.0263	0.0217	0.0046	0.0001	0.0222
116 – 125	0.6333	0.0254	0.0201	0.0046	0.0001	0.0206
125 – 135	0.6854	0.0295	0.0222	0.0054	0.0001	0.0229
135 – 147	0.7225	0.0315	0.0236	0.0062	0.0001	0.0244
147 – 160	0.7691	0.0370	0.0257	0.0073	0.0001	0.0267
160 – 175	0.7329	0.0370	0.0245	0.0077	0.0000	0.0256
175 – 192	0.6660	0.0362	0.0222	0.0077	0.0000	0.0235
192 – 211	0.6813	0.0408	0.0231	0.0088	0.0001	0.0247
211 – 233	0.6680	0.0431	0.0230	0.0096	0.0001	0.0249
233 – 259	0.7224	0.0483	0.0250	0.0116	0.0002	0.0275
259 – 291	0.6889	0.0522	0.0252	0.0125	0.0002	0.0281
291 – 330	0.6552	0.0519	0.0232	0.0136	0.0003	0.0268
330 – 379	0.8075	0.0682	0.0298	0.0192	0.0005	0.0355
379 – 441	0.8263	0.0748	0.0297	0.0230	0.0009	0.0376
441 – 525	0.5699	0.0613	0.0208	0.0188	0.0009	0.0281
525 – 660	0.6800	0.0708	0.0243	0.0280	0.0017	0.0371
660 – 880	0.7105	0.0868	0.0260	0.0388	0.0028	0.0468
880 – 1300	0.6204	0.0862	0.0222	0.0486	0.0039	0.0536
1300 – 3300	0.9865	0.3601	0.0531	0.0818	0.0111	0.0981

TABLE SM XI: The beryllium to boron flux ratio Be/B as a function of rigidity including errors due to statistics (stat.); contributions to the systematic error from the trigger, acceptance and background contamination (acc.); the rigidity resolution function and unfolding (unf.); the absolute rigidity scale (scale); and the total systematic error (syst.). The statistical errors are the sum in quadrature of the relative statistical errors of the fluxes multiplied by the ratio. The systematic errors from the background subtraction, the trigger, and the event reconstruction and selection are likewise added in quadrature. The correlations in the systematic errors from the uncertainty in nuclear interaction cross sections, unfolding, and the absolute rigidity scale between the fluxes have been accounted for in calculating the corresponding systematic errors. The contributions of individual sources to the systematic error are added in quadrature to arrive at the total systematic uncertainty.

Rigidity [GV]	Be/B	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
2.15 – 2.40	0.3157	0.0027	0.0158	0.0026	0.0002	0.0161
2.40 – 2.67	0.3002	0.0024	0.0137	0.0021	0.0001	0.0139
2.67 – 2.97	0.3062	0.0022	0.0128	0.0018	0.0001	0.0130
2.97 – 3.29	0.3161	0.0022	0.0122	0.0016	0.0000	0.0123
3.29 – 3.64	0.3150	0.0020	0.0114	0.0014	0.0000	0.0115
3.64 – 4.02	0.3177	0.0020	0.0108	0.0013	0.0000	0.0109
4.02 – 4.43	0.3178	0.0020	0.0103	0.0011	0.0000	0.0104
4.43 – 4.88	0.3248	0.0019	0.0101	0.0011	0.0001	0.0102
4.88 – 5.37	0.3272	0.0019	0.0099	0.0010	0.0001	0.0099
5.37 – 5.90	0.3290	0.0019	0.0097	0.0010	0.0001	0.0097
5.90 – 6.47	0.3330	0.0019	0.0096	0.0010	0.0001	0.0097
6.47 – 7.09	0.3348	0.0019	0.0095	0.0010	0.0001	0.0096
7.09 – 7.76	0.3368	0.0020	0.0095	0.0010	0.0000	0.0095
7.76 – 8.48	0.3334	0.0020	0.0093	0.0010	0.0000	0.0094
8.48 – 9.26	0.3375	0.0020	0.0094	0.0011	0.0000	0.0094
9.26 – 10.1	0.3405	0.0021	0.0094	0.0011	0.0000	0.0094
10.1 – 11.0	0.3377	0.0023	0.0093	0.0011	0.0000	0.0093
11.0 – 12.0	0.3360	0.0024	0.0092	0.0011	0.0000	0.0093
12.0 – 13.0	0.3424	0.0026	0.0093	0.0011	0.0000	0.0094
13.0 – 14.1	0.3423	0.0027	0.0093	0.0011	0.0000	0.0094
14.1 – 15.3	0.3412	0.0029	0.0093	0.0010	0.0000	0.0094
15.3 – 16.6	0.3406	0.0030	0.0093	0.0010	0.0000	0.0094
16.6 – 18.0	0.3525	0.0033	0.0096	0.0010	0.0000	0.0097
18.0 – 19.5	0.3419	0.0034	0.0094	0.0010	0.0000	0.0094
19.5 – 21.1	0.3490	0.0036	0.0096	0.0010	0.0000	0.0097
21.1 – 22.8	0.3539	0.0037	0.0098	0.0010	0.0001	0.0098
22.8 – 24.7	0.3501	0.0038	0.0097	0.0010	0.0001	0.0098
24.7 – 26.7	0.3438	0.0039	0.0096	0.0009	0.0001	0.0096
26.7 – 28.8	0.3424	0.0041	0.0096	0.0009	0.0001	0.0096
28.8 – 31.1	0.3565	0.0044	0.0101	0.0010	0.0001	0.0101
31.1 – 33.5	0.3641	0.0048	0.0103	0.0010	0.0001	0.0104
33.5 – 36.1	0.3548	0.0050	0.0101	0.0010	0.0001	0.0102

Table continued

TABLE SM XI – *(Continued).*

Rigidity [GV]	Be/B	$\sigma_{\text{stat.}}$	$\sigma_{\text{acc.}}$	$\sigma_{\text{unf.}}$	σ_{scale}	$\sigma_{\text{syst.}}$
36.1 – 38.9	0.3609	0.0054	0.0104	0.0010	0.0001	0.0105
38.9 – 41.9	0.3692	0.0060	0.0108	0.0011	0.0001	0.0108
41.9 – 45.1	0.3560	0.0063	0.0105	0.0011	0.0001	0.0105
45.1 – 48.5	0.3575	0.0068	0.0106	0.0011	0.0001	0.0106
48.5 – 52.2	0.3642	0.0075	0.0110	0.0012	0.0001	0.0110
52.2 – 56.1	0.3600	0.0080	0.0109	0.0012	0.0001	0.0110
56.1 – 60.3	0.3632	0.0087	0.0112	0.0013	0.0001	0.0112
60.3 – 64.8	0.3729	0.0096	0.0116	0.0014	0.0001	0.0117
64.8 – 69.7	0.3564	0.0100	0.0113	0.0015	0.0000	0.0114
69.7 – 74.9	0.3741	0.0112	0.0119	0.0016	0.0000	0.0120
74.9 – 80.5	0.3469	0.0114	0.0113	0.0016	0.0000	0.0114
80.5 – 86.5	0.3654	0.0127	0.0119	0.0019	0.0000	0.0121
86.5 – 93.0	0.3754	0.0137	0.0123	0.0021	0.0000	0.0125
93.0 – 100	0.3761	0.0150	0.0126	0.0022	0.0000	0.0128
100 – 108	0.3703	0.0157	0.0128	0.0024	0.0000	0.0130
108 – 116	0.3812	0.0181	0.0133	0.0027	0.0000	0.0136
116 – 125	0.3501	0.0175	0.0123	0.0027	0.0001	0.0126
125 – 135	0.3349	0.0186	0.0122	0.0028	0.0001	0.0125
135 – 147	0.3787	0.0207	0.0137	0.0035	0.0001	0.0142
147 – 160	0.3582	0.0224	0.0135	0.0036	0.0001	0.0139
160 – 175	0.3788	0.0241	0.0141	0.0043	0.0002	0.0147
175 – 192	0.3072	0.0221	0.0117	0.0039	0.0002	0.0123
192 – 211	0.3142	0.0248	0.0122	0.0044	0.0002	0.0130
211 – 233	0.3792	0.0299	0.0145	0.0060	0.0003	0.0157
233 – 259	0.3553	0.0304	0.0138	0.0063	0.0004	0.0152
259 – 291	0.4023	0.0368	0.0164	0.0081	0.0005	0.0183
291 – 330	0.3360	0.0339	0.0135	0.0078	0.0006	0.0156
330 – 379	0.3469	0.0391	0.0146	0.0094	0.0007	0.0174
379 – 441	0.3980	0.0460	0.0160	0.0127	0.0011	0.0205
441 – 525	0.3184	0.0428	0.0134	0.0124	0.0011	0.0183
525 – 660	0.3347	0.0450	0.0138	0.0167	0.0015	0.0217
660 – 880	0.3574	0.0557	0.0152	0.0248	0.0021	0.0292
880 – 1300	0.2829	0.0527	0.0125	0.0299	0.0021	0.0325
1300 – 3300	0.2654	0.1530	0.0191	0.0268	0.0027	0.0330

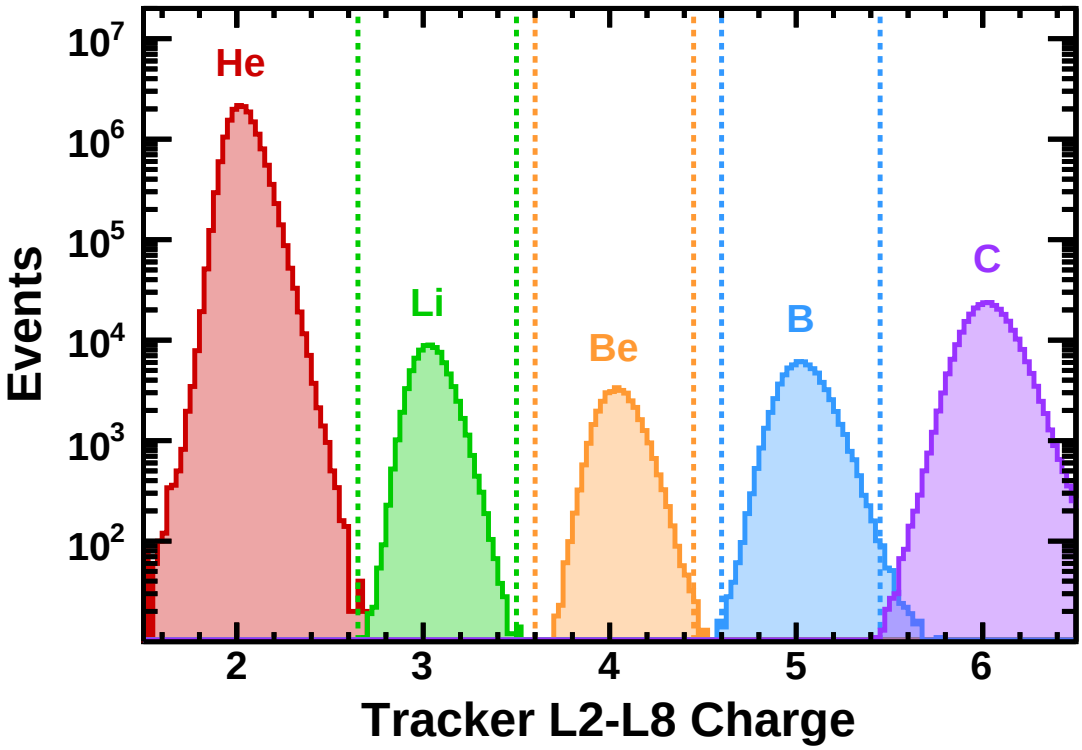

FIG. SM 1. Charge distribution measured by the inner tracker ($L2$-$L8$) for samples of He (red), Li (green), Be (orange), B (light blue), and C (violet) events with rigidity >4 GV selected with the charge measured on tracker planes $L1$ and $L9$ and the upper and lower TOF. The vertical dashed lines correspond to the charge selection in the inner tracker for lithium, beryllium, and boron.

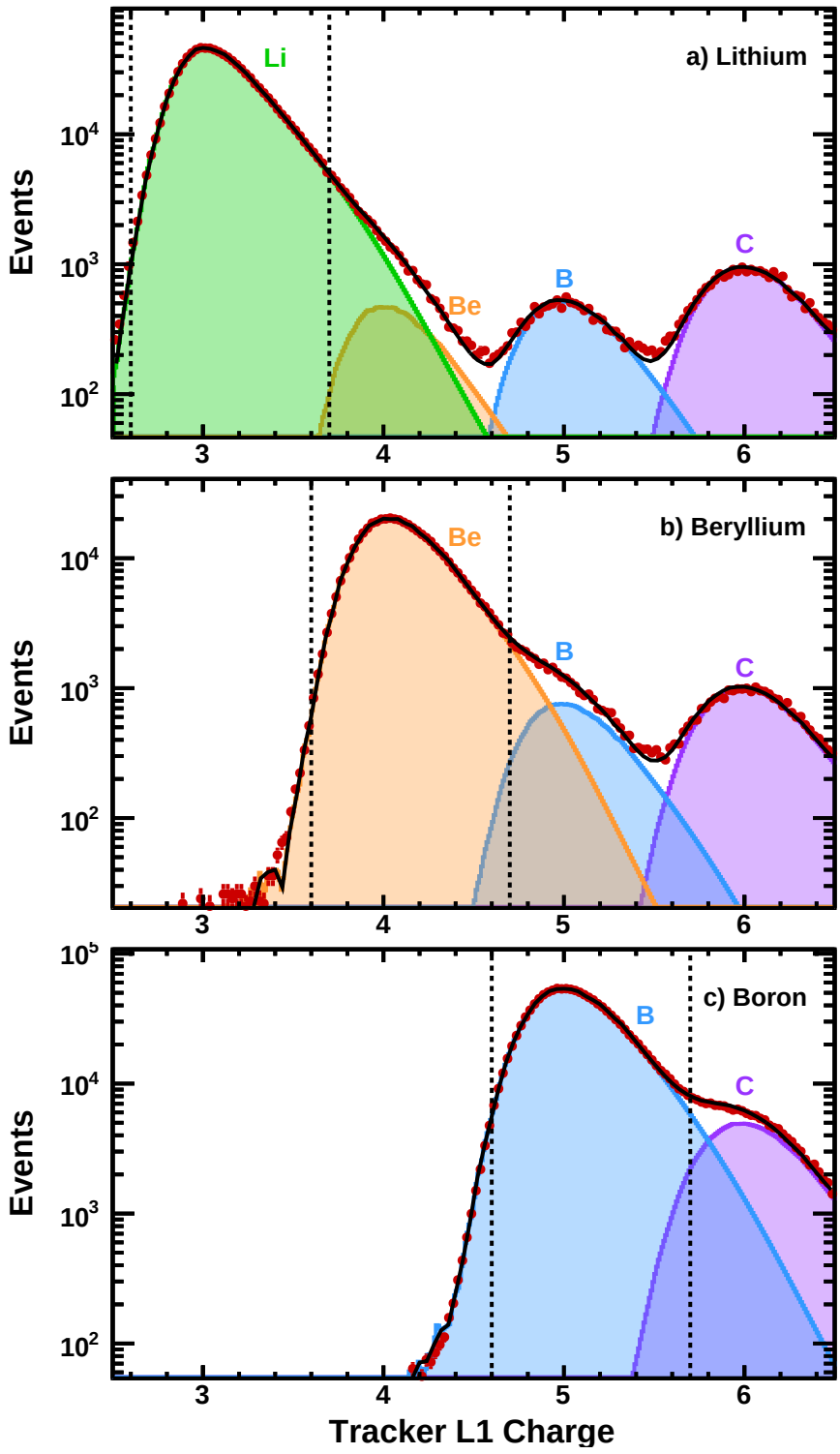

FIG. SM 2. Charge distributions measured by tracker $L1$ for (a) lithium, (b) beryllium, and (c) boron events selected by the inner tracker with rigidity 9 to 11 GV (red circles). The solid black curve shows the fit of the sum of the charge distribution templates for Li (green), Be (orange), B (light blue), and C (violet) to the data. The templates are obtained from a selection of non-interacting samples on $L2$ by the use of the charge measurement from $L1$ and $L3$-$L8$. The charge selection cuts applied on $L1$ are shown as vertical dashed lines.

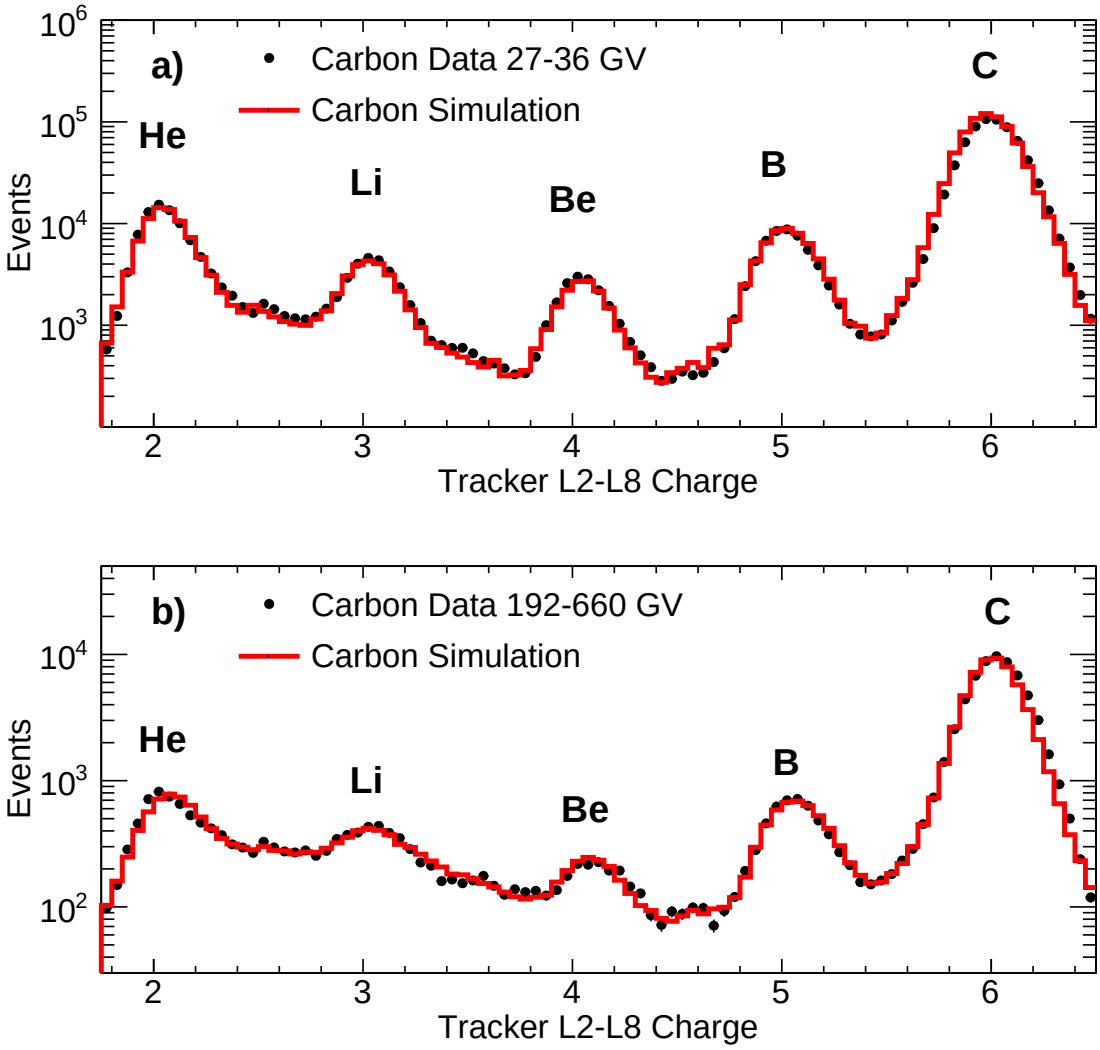

FIG. SM 3. The charge distribution measured by the inner tracker ($L2$-$L8$, MDR ~700 GV) for a sample of carbon events selected with tracker $L1$ in the rigidity range (a) from 27 to 36 GV and (b) from 192 to 660 GV. MC distributions (red histograms) are normalized to the non-interacting carbon peak measured in the data (points).

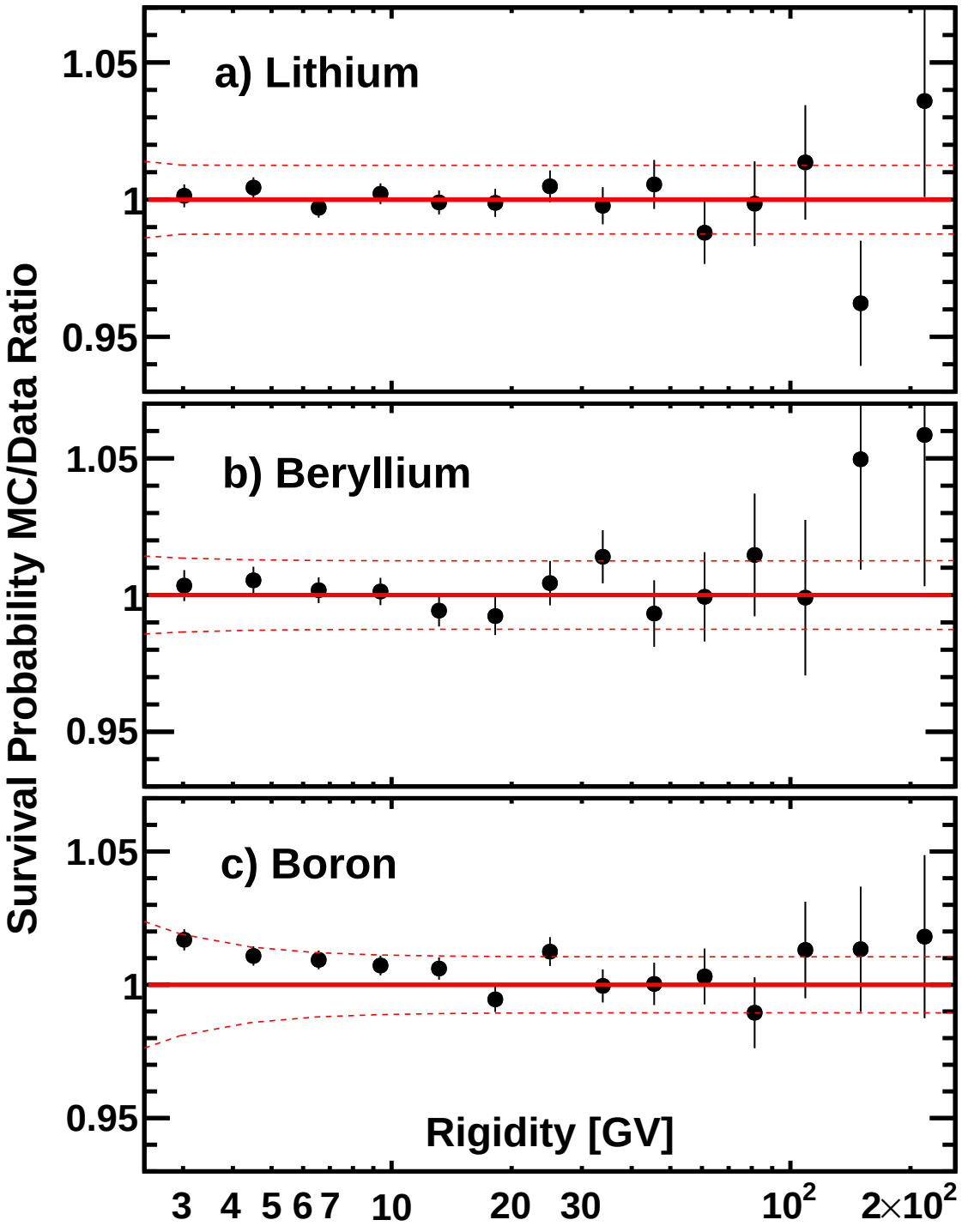

FIG. SM 4. The MC/data ratio of survival probabilities between tracker $L8$ and $L9$ for (a) lithium, (b) beryllium, and (c) boron. The solid lines represent fits to the data above 30 GV and the dashed lines indicate the systematic error range of the survival probability.

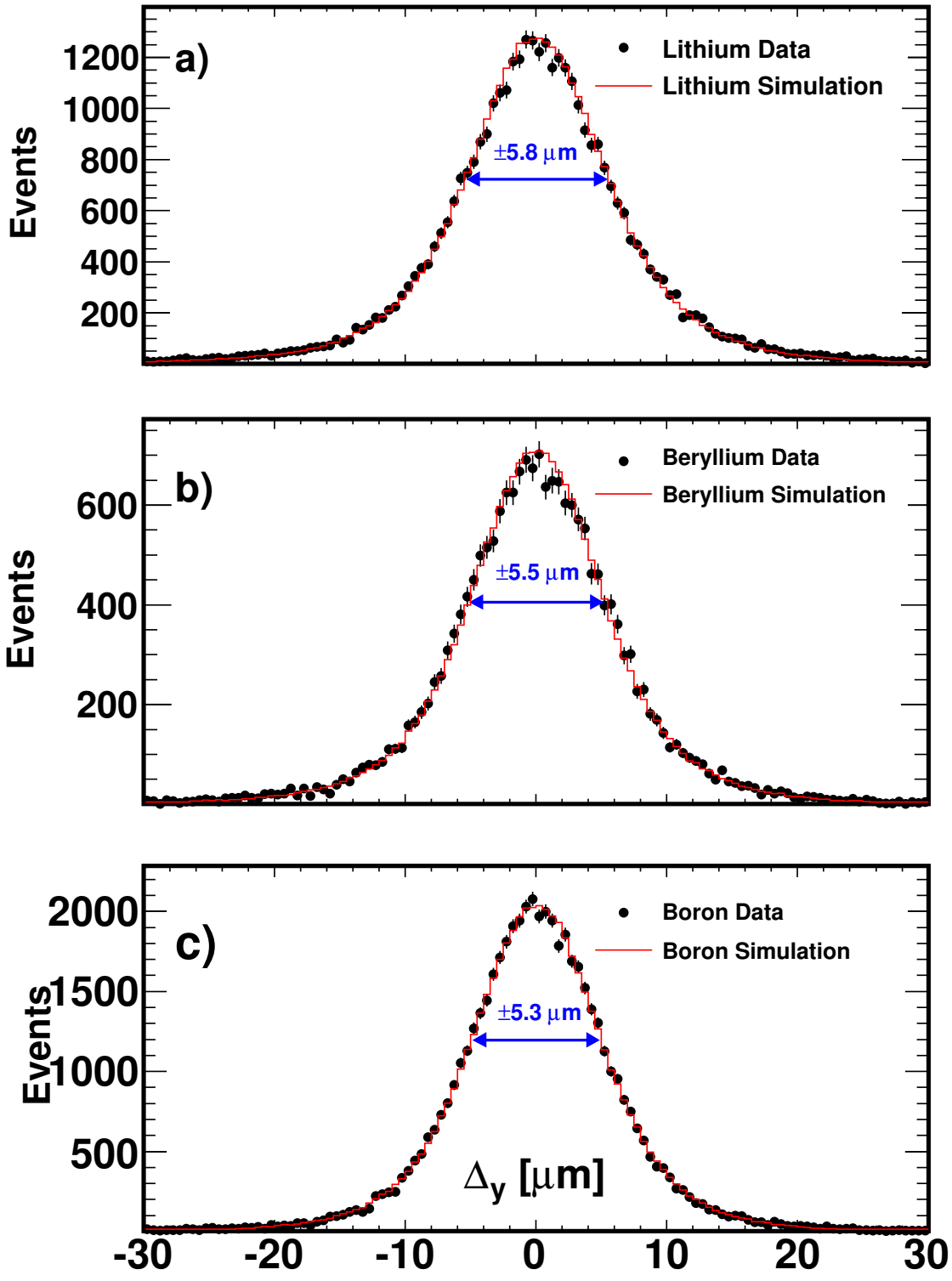

FIG. SM 5. Comparison between data and simulation for events with $R > 50$ GV of the differences of the coordinates measured in tracker layers $L3$ or $L5$ to those obtained from the track fit using the measurements from $L1$, $L2$, $L4$, $L6$, $L7$, and $L8$ for (a) lithium, (b) beryllium, and (c) boron. The observed bending coordinate resolution is 5.3–5.8 μm.

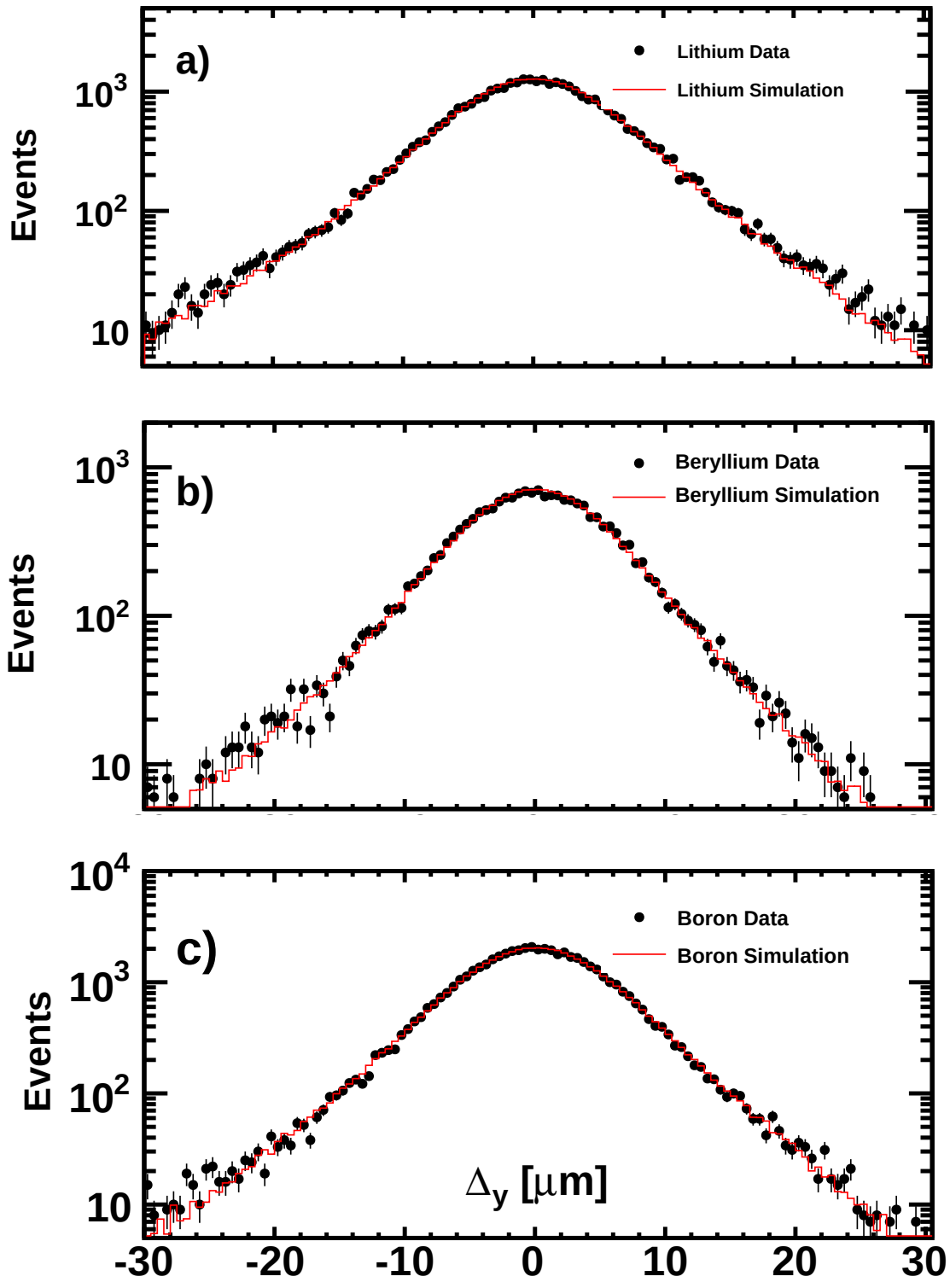

FIG. SM 6. Figure 5 of SM with logarithmic vertical scales showing the detailed comparison between the data and the simulation for the tails of the distributions.

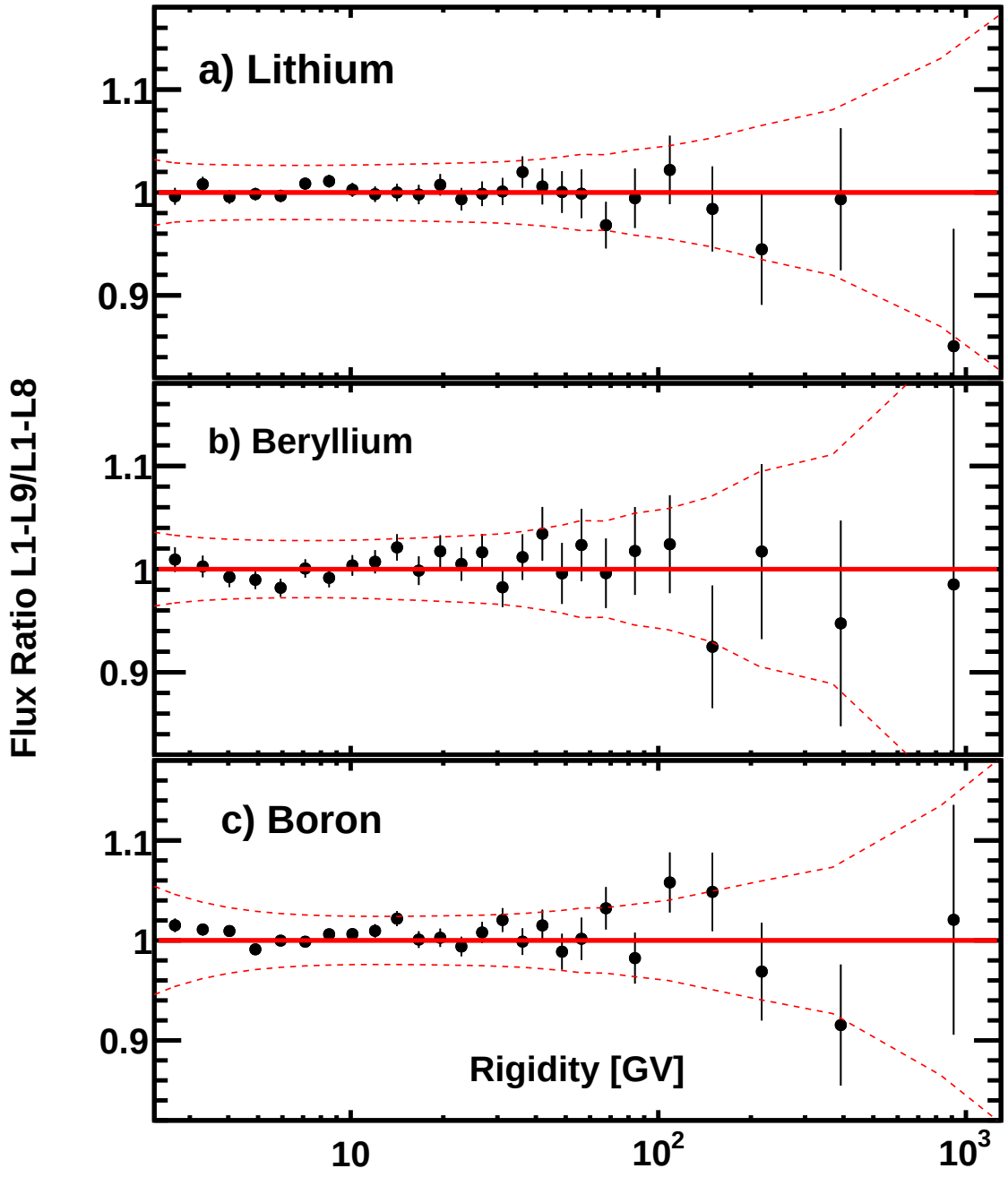

FIG. SM 7. The ratio of (a) lithium, (b) beryllium, and (c) boron fluxes measured with events passing through $L1$ to $L9$ to that measured using events passing through $L1$ to $L8$ (black circles). Error bars correspond to the statistical errors. The dashed red lines show the systematic errors. The solid red lines are placed at unity to guide the eye.

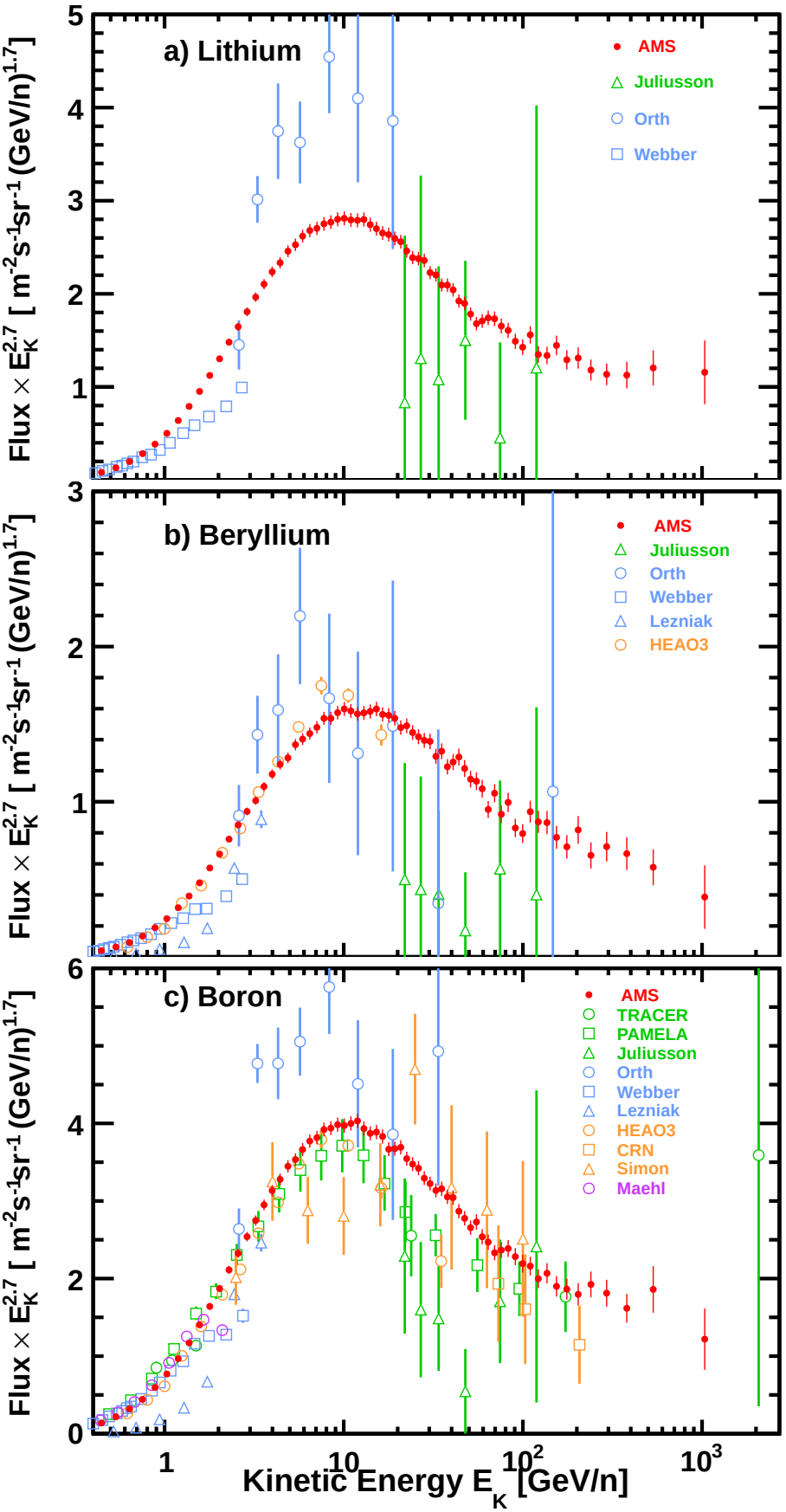

FIG. SM 8. The AMS (a) lithium, (b) beryllium, and (c) boron fluxes as functions of kinetic energy per nucleon E_K multiplied by $E_K^{2.7}$ together with earlier measurements. For (a) we examined the significance of the possible feature in the lithium flux around 60 GeV/n by fitting the spectrum with a single power law function $\Phi = CE_K^{\gamma}$ in the range 30 to 90 GeV/n. The fit yields a χ^2/d.o.f.= 11.1/13, which shows that the structure is consistent with a statistical fluctuation.

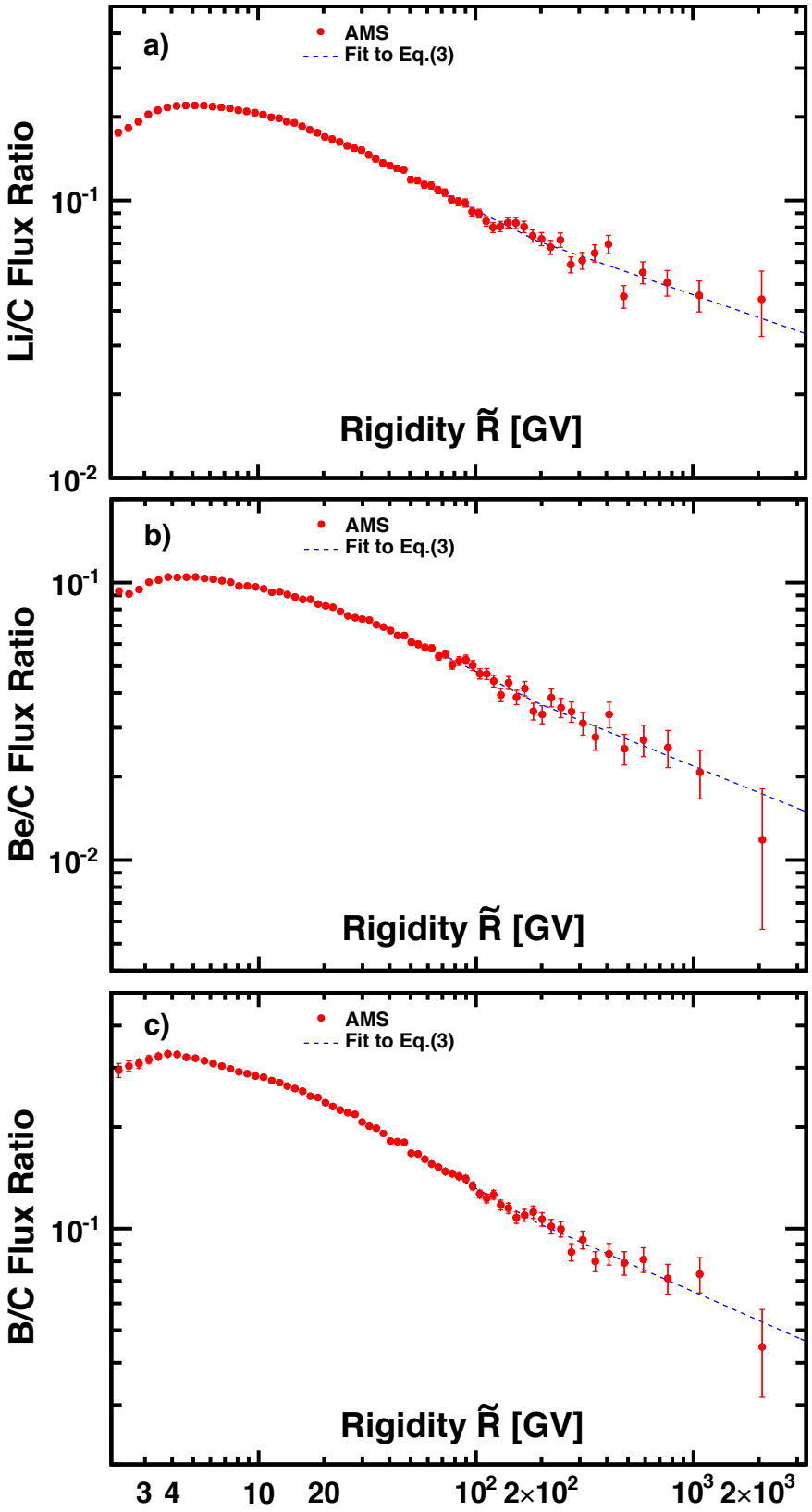

FIG. SM 9. The AMS (a) Li/C, (b) Be/C, and (c) B/C flux ratios as functions of rigidity together with the Eq. (3) fits (dashed lines) for the two rigidity intervals [192–3300] and [60.3–192] GV. The difference between the spectral indices in these rigidity intervals is 0.13 ± 0.06 for Li/C, 0.09 ± 0.07 for Be/C, and 0.09 ± 0.05 for B/C.

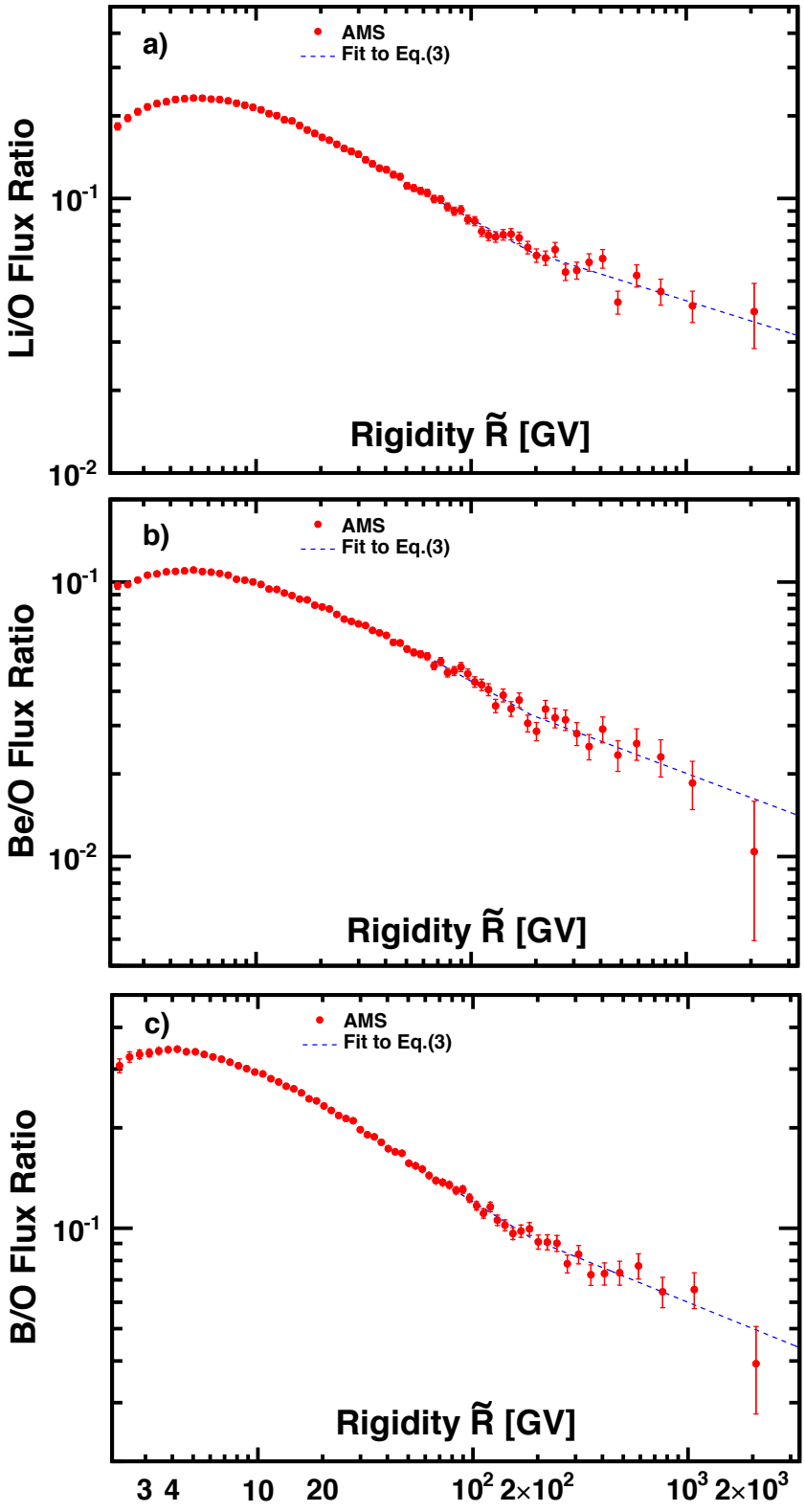

FIG. SM 10. The AMS (a) Li/O, (b) Be/O, and (c) B/O flux ratios as functions of rigidity together with the Eq. (3) fits (dashed lines) for the two rigidity intervals [192–3300] and [60.3–192] GV. The difference between the spectral indices in these rigidity intervals is 0.19 ± 0.06 for Li/O, 0.15 ± 0.07 for Be/O, and 0.14 ± 0.05 for B/O.

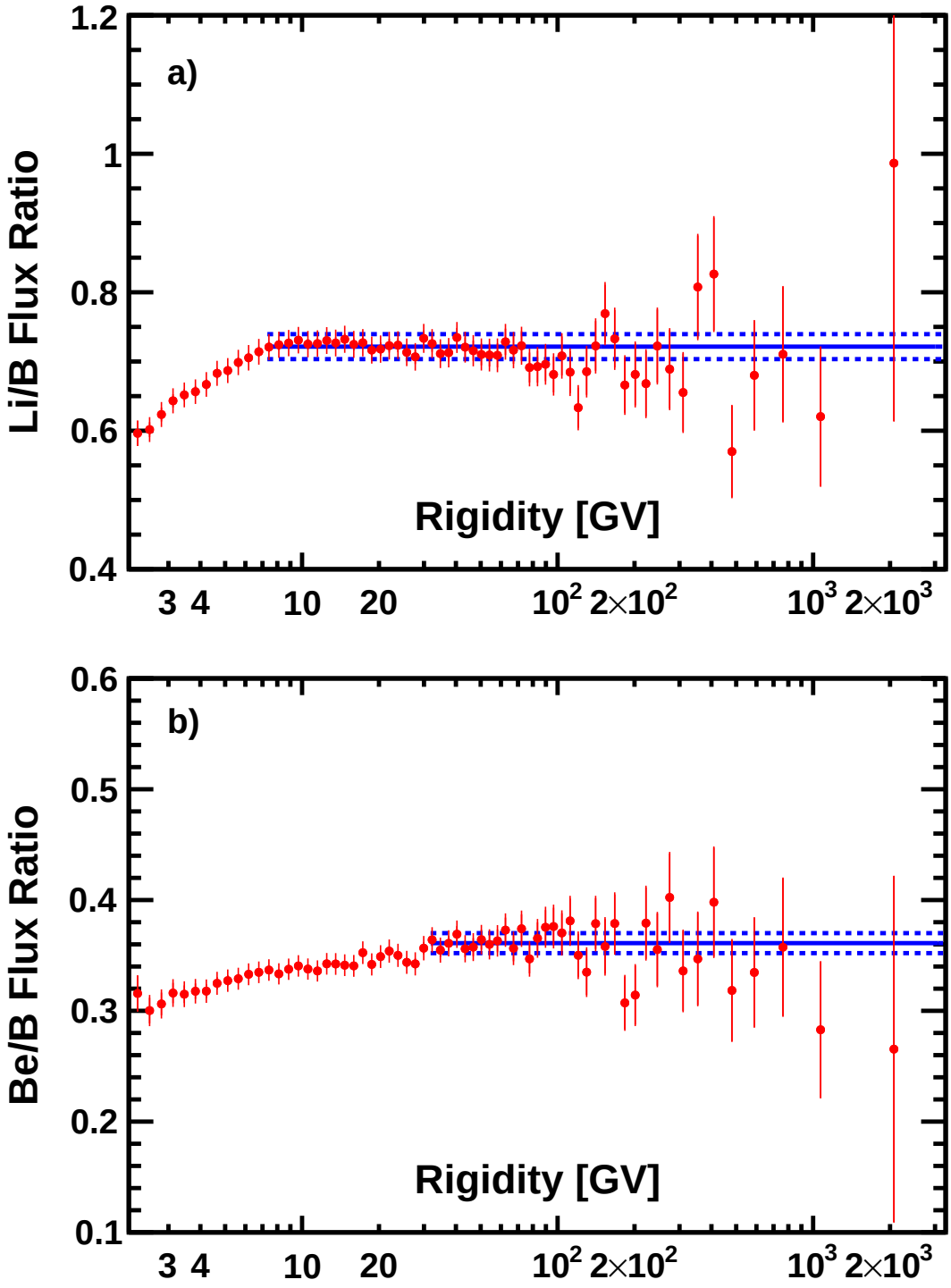

FIG. SM 11. The AMS (a) Li/B and (b) Be/B ratios as functions of rigidity together with the results of fits of constant values (solid blue lines) with errors (68% C.L., dashed blue lines) above 7 GV for Li/B and above 30 GV for Be/B. The fits yield Li/B $= 0.72 \pm 0.02$ with χ^2/d.o.f.=51/53 and Be/B $= 0.36 \pm 0.01$ with χ^2/d.o.f.=27/35.

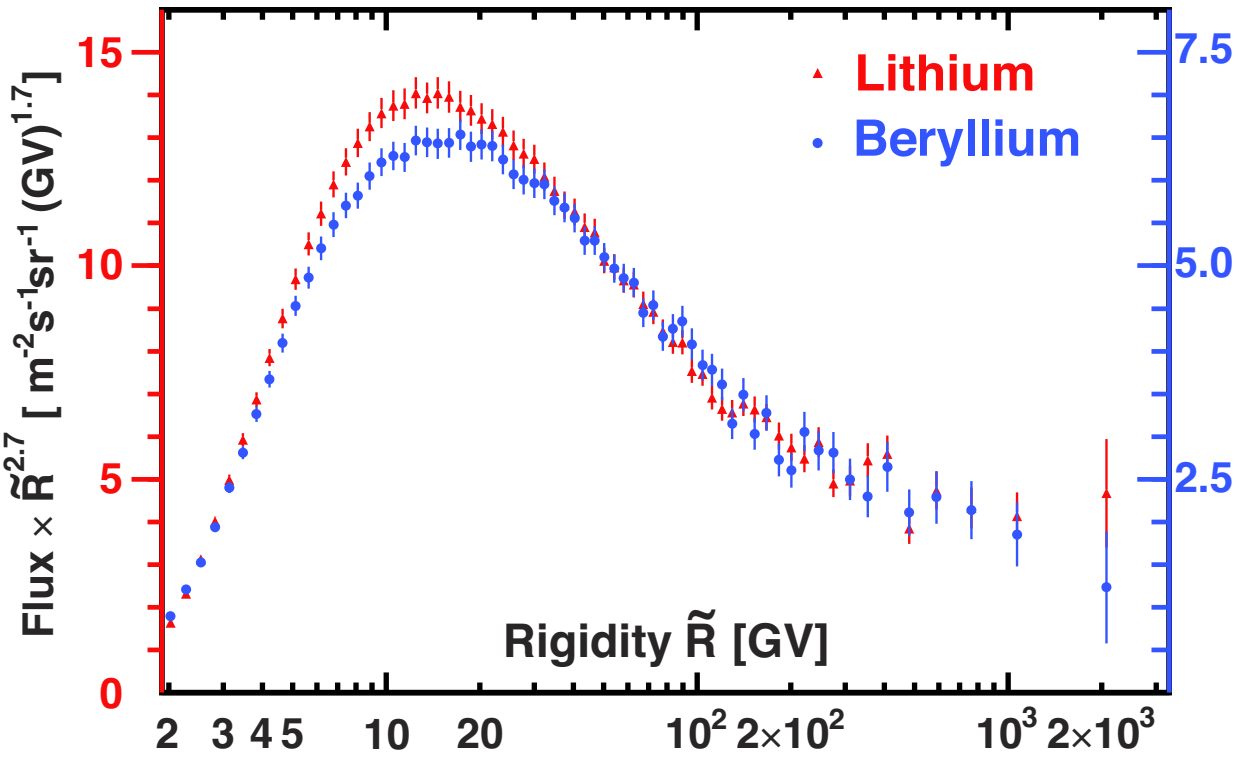

FIG. SM 12. The AMS Li (red, left axis) and Be (blue, right axis) fluxes multiplied by $\tilde{R}^{2.7}$ with their total errors as a function of rigidity. As seen, the Li and Be fluxes have identical rigidity dependence above ∼30 GV, and their ratio is 2.0 ± 0.1.

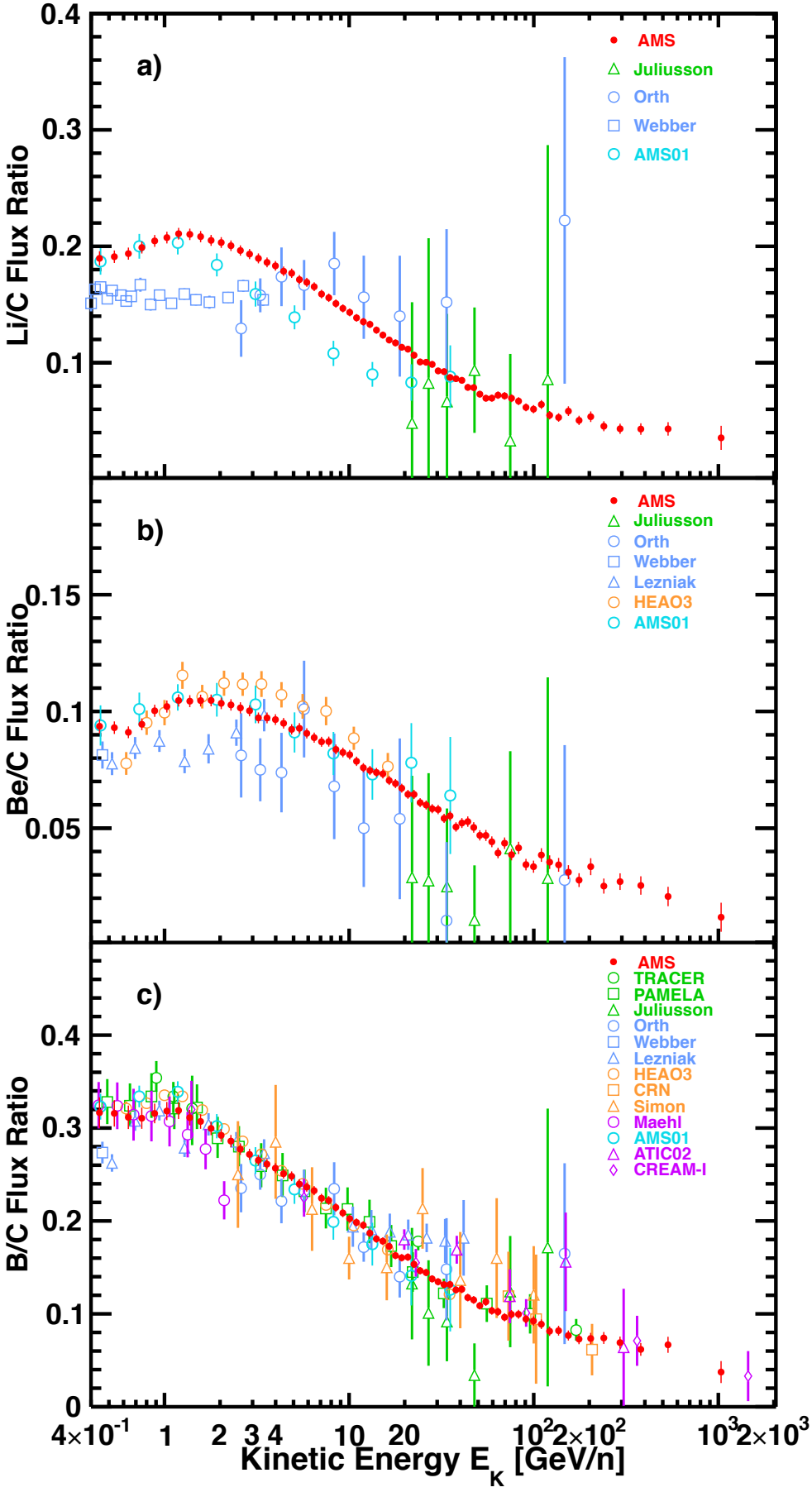

FIG. SM 13. The AMS (a) Li/C, (b) Be/C, and (c) B/C flux ratios as functions of kinetic energy per nucleon E_K together with earlier measurements.

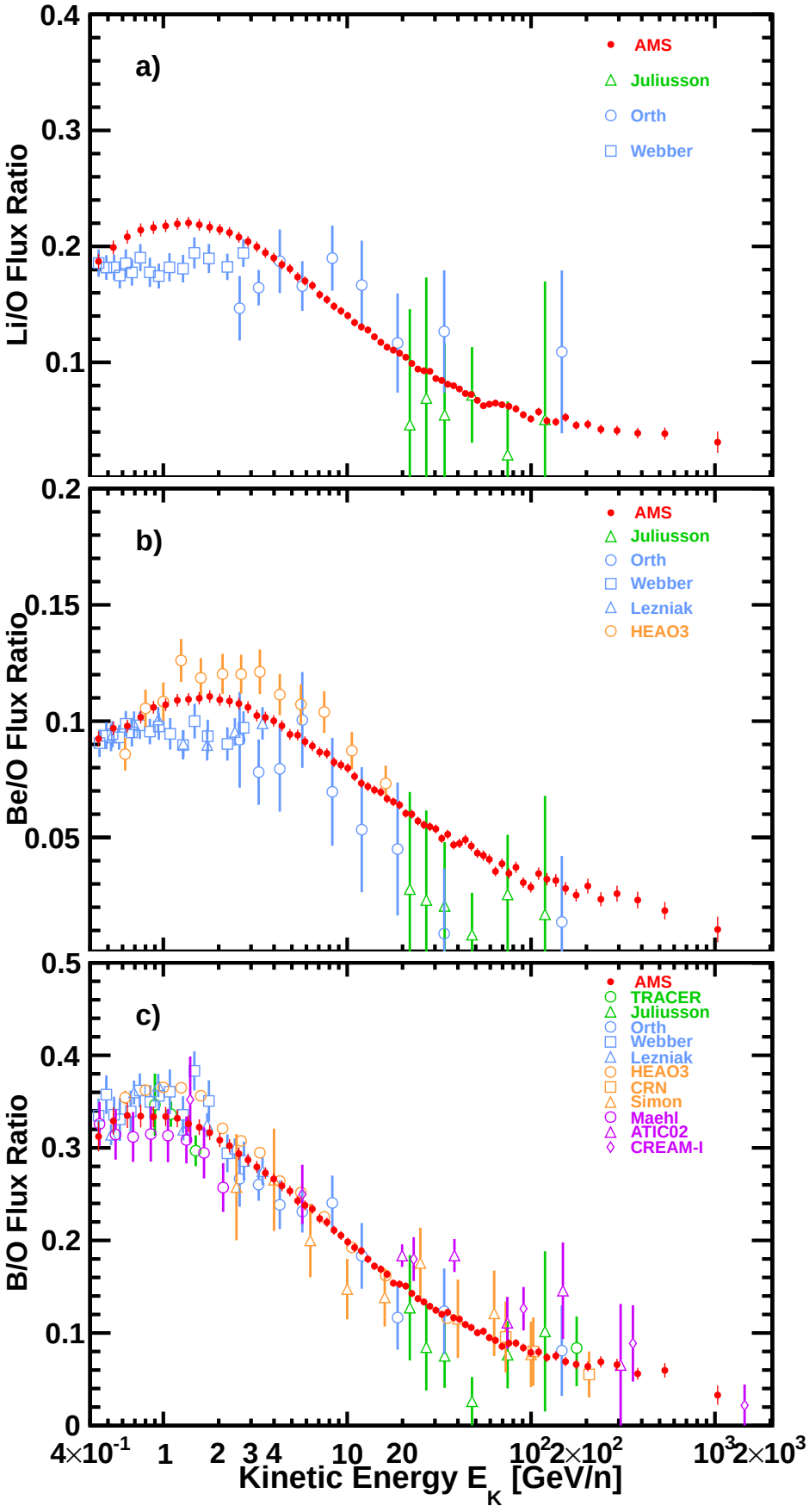

FIG. SM 14. The AMS (a) Li/O, (b) Be/O, and (c) B/O flux ratios as functions of kinetic energy per nucleon E_K together with earlier measurements.

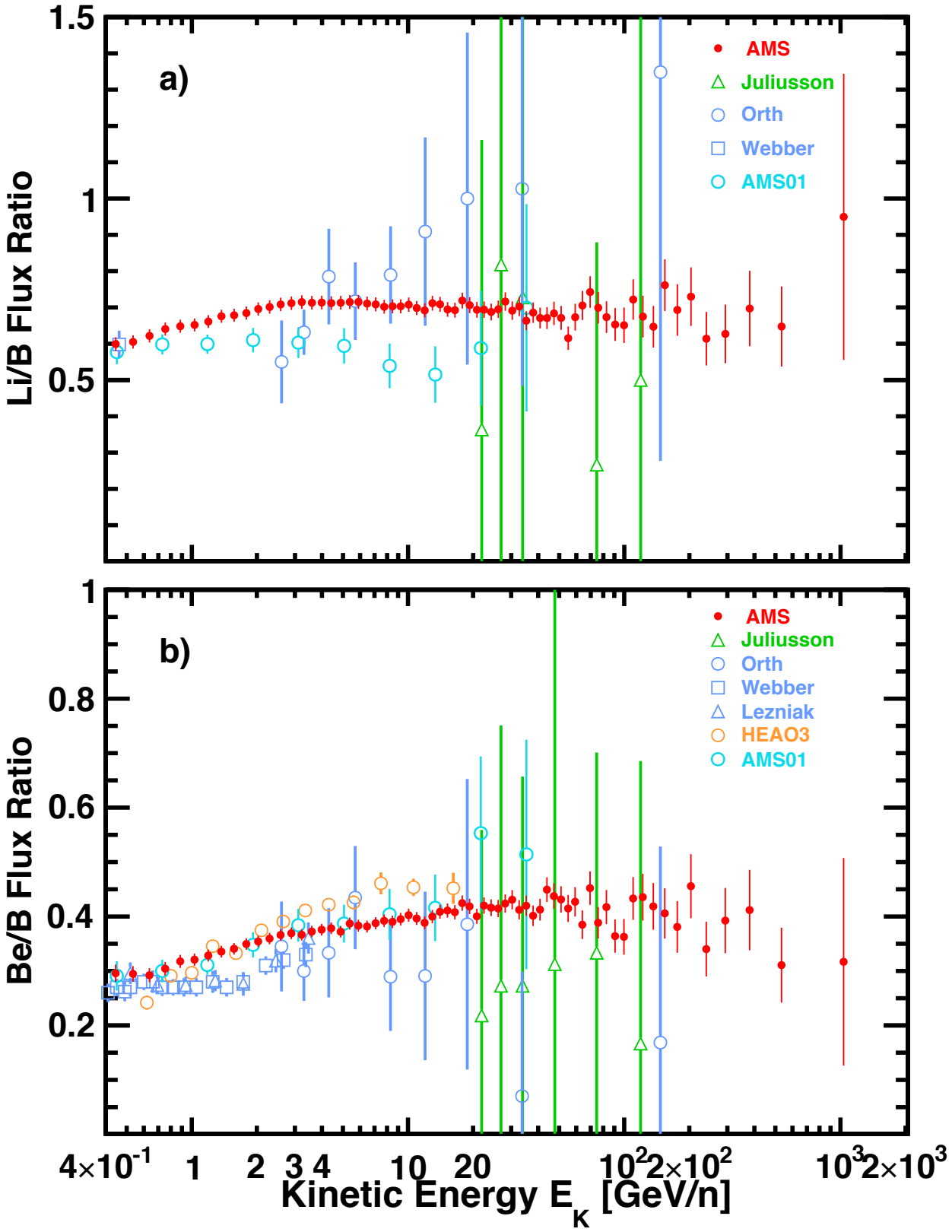

FIG. SM 15. The AMS (a) Li/B and (b) Be/B ratios as functions of kinetic energy per nucleon E_K together with earlier measurements.