

**Table 123: Muons in Brain (ICRP)**

	$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
	0.55423	1.030	73.3	0.08255	3.5585	0.2206	2.8021	3.4279	0.00
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]		
10.0 MeV	$4.704 \times 10^1$	7.976				7.976	$6.928 \times 10^{-1}$		
14.0 MeV	$5.616 \times 10^1$	6.221				6.221	$1.267 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	4.858				4.858	$2.371 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	3.768				3.768	$4.741 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	3.218				3.218	$7.631 \times 10^0$		
80.0 MeV	$1.527 \times 10^2$	2.415				2.415	$2.244 \times 10^1$		
100. MeV	$1.764 \times 10^2$	2.271				2.271	$3.100 \times 10^1$		
140. MeV	$2.218 \times 10^2$	2.115				2.115	$4.934 \times 10^1$		
200. MeV	$2.868 \times 10^2$	2.025				2.025	$7.844 \times 10^1$		
300. MeV	$3.917 \times 10^2$	1.991			0.000	1.991	$1.284 \times 10^2$		
318. MeV	$4.105 \times 10^2$	1.990			0.000	1.990	<i>Minimum ionization</i>		
400. MeV	$4.945 \times 10^2$	1.997			0.000	1.997	$1.786 \times 10^2$		
800. MeV	$8.995 \times 10^2$	2.071	0.000		0.000	2.072	$3.753 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	2.106	0.000		0.000	2.106	$4.710 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	2.161	0.000		0.001	2.163	$6.583 \times 10^2$		
2.00 GeV	$2.103 \times 10^3$	2.223	0.001	0.000	0.001	2.225	$9.316 \times 10^2$		
3.00 GeV	$3.104 \times 10^3$	2.293	0.001	0.001	0.001	2.296	$1.374 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	2.341	0.001	0.001	0.002	2.346	$1.804 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	2.453	0.004	0.003	0.004	2.464	$3.463 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	2.487	0.005	0.005	0.005	2.501	$4.268 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	2.536	0.007	0.008	0.007	2.557	$5.849 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	2.585	0.011	0.013	0.009	2.619	$8.166 \times 10^3$		
30.0 GeV	$3.011 \times 10^4$	2.639	0.018	0.022	0.013	2.693	$1.193 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	2.675	0.026	0.033	0.018	2.752	$1.560 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	2.759	0.059	0.080	0.034	2.932	$2.966 \times 10^4$		
100. GeV	$1.001 \times 10^5$	2.785	0.077	0.105	0.042	3.010	$3.639 \times 10^4$		
140. GeV	$1.401 \times 10^5$	2.824	0.113	0.158	0.059	3.154	$4.937 \times 10^4$		
200. GeV	$2.001 \times 10^5$	2.864	0.171	0.242	0.084	3.361	$6.779 \times 10^4$		
300. GeV	$3.001 \times 10^5$	2.910	0.269	0.384	0.125	3.689	$9.617 \times 10^4$		
400. GeV	$4.001 \times 10^5$	2.943	0.372	0.532	0.167	4.014	$1.221 \times 10^5$		
800. GeV	$8.001 \times 10^5$	3.022	0.799	1.149	0.337	5.308	$2.085 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	3.048	1.019	1.468	0.424	5.960	$2.441 \times 10^5$		
1.05 TeV	$1.046 \times 10^6$	3.053	1.069	1.540	0.444	6.107	<i>Muon critical energy</i>		
1.40 TeV	$1.400 \times 10^6$	3.088	1.463	2.102	0.601	7.255	$3.048 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	3.130	2.146	3.075	0.871	9.221	$3.780 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	3.178	3.290	4.693	1.334	12.496	$4.708 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	3.213	4.454	6.335	1.806	15.808	$5.418 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	3.299	9.169	12.946	3.769	29.183	$7.253 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	3.327	11.553	16.275	4.780	35.937	$7.869 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	3.371	16.312	22.910	6.864	49.457	$8.814 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	3.417	23.512	32.916	10.067	69.912	$9.830 \times 10^5$		
30.0 TeV	$3.000 \times 10^7$	3.471	35.500	49.566	15.625	104.162	$1.099 \times 10^6$		
40.0 TeV	$4.000 \times 10^7$	3.510	47.553	66.269	21.330	138.662	$1.182 \times 10^6$		
80.0 TeV	$8.000 \times 10^7$	3.605	95.899	133.136	45.276	277.917	$1.382 \times 10^6$		
100. TeV	$1.000 \times 10^8$	3.637	120.142	166.609	57.689	348.078	$1.446 \times 10^6$		