

## Muons in air (dry, 1 atm)

$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
0.49919	$1.205 \times 10^{-3}$	85.7	0.10914	3.3994	1.7418	4.2759	10.5961	0.00
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod [MeV cm <sup>2</sup> /g]	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]	
10.0 MeV	$4.704 \times 10^1$	7.039				7.039	$7.862 \times 10^{-1}$	
14.0 MeV	$5.616 \times 10^1$	5.494				5.495	$1.436 \times 10^0$	
20.0 MeV	$6.802 \times 10^1$	4.294				4.294	$2.686 \times 10^0$	
30.0 MeV	$8.509 \times 10^1$	3.333				3.333	$5.366 \times 10^0$	
40.0 MeV	$1.003 \times 10^2$	2.847				2.847	$8.633 \times 10^0$	
80.0 MeV	$1.527 \times 10^2$	2.140				2.140	$2.535 \times 10^1$	
100. MeV	$1.764 \times 10^2$	2.013				2.014	$3.501 \times 10^1$	
140. MeV	$2.218 \times 10^2$	1.889				1.889	$5.562 \times 10^1$	
200. MeV	$2.868 \times 10^2$	1.827				1.827	$8.803 \times 10^1$	
257. MeV	$3.471 \times 10^2$	1.815			0.000	1.816	<i>Minimum ionization</i>	
300. MeV	$3.917 \times 10^2$	1.819			0.000	1.819	$1.430 \times 10^2$	
400. MeV	$4.945 \times 10^2$	1.844			0.000	1.844	$1.977 \times 10^2$	
800. MeV	$8.995 \times 10^2$	1.968	0.000		0.000	1.968	$4.074 \times 10^2$	
1.00 GeV	$1.101 \times 10^3$	2.020	0.000		0.000	2.021	$5.077 \times 10^2$	
1.40 GeV	$1.502 \times 10^3$	2.105	0.000		0.001	2.106	$7.014 \times 10^2$	
2.00 GeV	$2.103 \times 10^3$	2.201	0.001	0.000	0.001	2.203	$9.796 \times 10^2$	
3.00 GeV	$3.104 \times 10^3$	2.314	0.001	0.001	0.001	2.318	$1.421 \times 10^3$	
4.00 GeV	$4.104 \times 10^3$	2.396	0.001	0.001	0.002	2.401	$1.845 \times 10^3$	
8.00 GeV	$8.105 \times 10^3$	2.577	0.004	0.003	0.004	2.588	$3.440 \times 10^3$	
10.0 GeV	$1.011 \times 10^4$	2.627	0.005	0.005	0.005	2.642	$4.204 \times 10^3$	
14.0 GeV	$1.411 \times 10^4$	2.698	0.007	0.008	0.007	2.720	$5.695 \times 10^3$	
20.0 GeV	$2.011 \times 10^4$	2.767	0.011	0.013	0.009	2.800	$7.867 \times 10^3$	
30.0 GeV	$3.011 \times 10^4$	2.838	0.019	0.023	0.013	2.893	$1.138 \times 10^4$	
40.0 GeV	$4.011 \times 10^4$	2.885	0.026	0.033	0.017	2.962	$1.479 \times 10^4$	
80.0 GeV	$8.011 \times 10^4$	2.984	0.060	0.080	0.034	3.159	$2.784 \times 10^4$	
100. GeV	$1.001 \times 10^5$	3.014	0.078	0.106	0.042	3.239	$3.409 \times 10^4$	
140. GeV	$1.401 \times 10^5$	3.055	0.114	0.159	0.058	3.388	$4.616 \times 10^4$	
200. GeV	$2.001 \times 10^5$	3.097	0.172	0.244	0.083	3.596	$6.335 \times 10^4$	
300. GeV	$3.001 \times 10^5$	3.143	0.272	0.387	0.124	3.926	$8.995 \times 10^4$	
400. GeV	$4.001 \times 10^5$	3.174	0.375	0.536	0.165	4.250	$1.144 \times 10^5$	
800. GeV	$8.001 \times 10^5$	3.247	0.803	1.158	0.334	5.543	$1.966 \times 10^5$	
1.00 TeV	$1.000 \times 10^6$	3.271	1.025	1.479	0.420	6.195	$2.307 \times 10^5$	
1.11 TeV	$1.115 \times 10^6$	3.282	1.152	1.661	0.470	6.565	<i>Muon critical energy</i>	
1.40 TeV	$1.400 \times 10^6$	3.306	1.471	2.117	0.595	7.490	$2.893 \times 10^5$	
2.00 TeV	$2.000 \times 10^6$	3.344	2.155	3.095	0.862	9.457	$3.605 \times 10^5$	
3.00 TeV	$3.000 \times 10^6$	3.388	3.302	4.723	1.321	12.735	$4.513 \times 10^5$	
4.00 TeV	$4.000 \times 10^6$	3.420	4.469	6.374	1.787	16.050	$5.211 \times 10^5$	
8.00 TeV	$8.000 \times 10^6$	3.497	9.189	13.021	3.730	29.437	$7.024 \times 10^5$	
10.0 TeV	$1.000 \times 10^7$	3.522	11.574	16.369	4.730	36.197	$7.636 \times 10^5$	
14.0 TeV	$1.400 \times 10^7$	3.561	16.335	23.040	6.790	49.727	$8.575 \times 10^5$	
20.0 TeV	$2.000 \times 10^7$	3.603	23.534	33.100	9.955	70.192	$9.586 \times 10^5$	
30.0 TeV	$3.000 \times 10^7$	3.652	35.519	49.841	15.447	104.458	$1.075 \times 10^6$	
40.0 TeV	$4.000 \times 10^7$	3.686	47.564	66.634	21.083	138.968	$1.157 \times 10^6$	
80.0 TeV	$8.000 \times 10^7$	3.773	95.872	133.867	44.722	278.233	$1.357 \times 10^6$	
100. TeV	$1.000 \times 10^8$	3.801	120.091	167.522	56.971	348.385	$1.421 \times 10^6$	