Table 029: Muons in Copper

Z	A [g/mol]	ρ [g/cm^3]	I [eV]	a	$k = m_s$	x_0	x_1	$\overline{C}$	δ_0
29 (Cu)	63.546 (3)	8.960	322.0	0.14339	2.9044	−0.0254	3.2792	4.4190	0.08

T	p [MeV/c]	Ionization	Brems	Pair prod	Photonucl	Total	CSDA range [g/cm^2]
		[MeV cm^2/g]					
10.0 MeV	4.704×10^1	5.283				5.283	1.069×10^0
14.0 MeV	5.616×10^1	4.160				4.160	1.930×10^0
20.0 MeV	6.802×10^1	3.277				3.277	3.573×10^0
30.0 MeV	8.509×10^1	2.562				2.562	7.071×10^0
40.0 MeV	1.003×10^2	2.198				2.198	1.131×10^1
80.0 MeV	1.527×10^2	1.659				1.659	3.291×10^1
100. MeV	1.764×10^2	1.561				1.561	4.537×10^1
140. MeV	2.218×10^2	1.464				1.465	7.195×10^1
200. MeV	2.868×10^2	1.414				1.414	1.138×10^2
267. MeV	3.577×10^2	1.403			0.000	1.403	*Minimum ionization*
300. MeV	3.917×10^2	1.404			0.000	1.404	1.849×10^2
400. MeV	4.945×10^2	1.419	0.000		0.000	1.419	2.558×10^2
800. MeV	8.995×10^2	1.499	0.000		0.000	1.500	5.298×10^2
1.00 GeV	1.101×10^3	1.532	0.001		0.000	1.533	6.617×10^2
1.40 GeV	1.502×10^3	1.585	0.001	0.000	0.001	1.587	9.179×10^2
2.00 GeV	2.103×10^3	1.643	0.002	0.001	0.001	1.647	1.289×10^3
3.00 GeV	3.104×10^3	1.709	0.003	0.002	0.001	1.716	1.882×10^3
4.00 GeV	4.104×10^3	1.755	0.005	0.004	0.002	1.765	2.457×10^3
8.00 GeV	8.105×10^3	1.860	0.011	0.011	0.003	1.886	4.641×10^3
10.0 GeV	1.011×10^4	1.891	0.015	0.016	0.004	1.926	5.690×10^3
14.0 GeV	1.411×10^4	1.936	0.023	0.025	0.006	1.991	7.731×10^3
20.0 GeV	2.011×10^4	1.981	0.035	0.041	0.008	2.067	1.069×10^4
30.0 GeV	3.011×10^4	2.029	0.058	0.072	0.012	2.172	1.540×10^4
40.0 GeV	4.011×10^4	2.061	0.082	0.105	0.016	2.265	1.991×10^4
80.0 GeV	8.011×10^4	2.133	0.185	0.252	0.031	2.602	3.636×10^4
100. GeV	1.001×10^5	2.155	0.240	0.332	0.038	2.765	4.381×10^4
140. GeV	1.401×10^5	2.187	0.352	0.495	0.053	3.088	5.750×10^4
200. GeV	2.001×10^5	2.221	0.527	0.755	0.075	3.579	7.553×10^4
300. GeV	3.001×10^5	2.259	0.828	1.189	0.113	4.389	1.007×10^5
317. GeV	3.170×10^5	2.264	0.880	1.264	0.119	4.528	*Muon critical energy*
400. GeV	4.001×10^5	2.285	1.139	1.640	0.151	5.215	1.216×10^5
800. GeV	8.001×10^5	2.351	2.425	3.491	0.304	8.571	1.809×10^5
1.00 TeV	1.000×10^6	2.372	3.087	4.439	0.382	10.280	2.021×10^5
1.40 TeV	1.400×10^6	2.404	4.414	6.331	0.542	13.691	2.357×10^5
2.00 TeV	2.000×10^6	2.439	6.446	9.220	0.784	18.890	2.729×10^5
3.00 TeV	3.000×10^6	2.479	9.842	14.023	1.199	27.544	3.165×10^5
4.00 TeV	4.000×10^6	2.508	13.286	18.879	1.621	36.295	3.480×10^5
8.00 TeV	8.000×10^6	2.579	27.184	38.410	3.372	71.545	4.251×10^5
10.0 TeV	1.000×10^7	2.602	34.193	48.231	4.272	89.299	4.500×10^5
14.0 TeV	1.400×10^7	2.637	48.174	67.823	6.121	124.756	4.878×10^5
20.0 TeV	2.000×10^7	2.676	69.280	97.344	8.956	178.257	5.278×10^5
30.0 TeV	3.000×10^7	2.720	104.417	146.463	13.860	267.461	5.733×10^5
40.0 TeV	4.000×10^7	2.752	139.692	195.708	18.883	357.035	6.055×10^5
80.0 TeV	8.000×10^7	2.831	281.045	392.831	39.878	716.586	6.831×10^5
100. TeV	1.000×10^8	2.856	351.860	491.490	50.730	896.937	7.080×10^5