

## Muons in erbium (Er)

Z	A [g/mol]	$\rho$ [g/cm <sup>3</sup> ]	I [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
68 (Er)	167.259(3)	9.026	658.0	0.24823	2.5573	0.0658	3.4932	5.9565	0.14
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod [MeV cm <sup>2</sup> /g]	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]		
10.0 MeV	$4.704 \times 10^1$	4.125				4.125	$1.396 \times 10^0$		
14.0 MeV	$5.616 \times 10^1$	3.277				3.277	$2.494 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	2.601				2.601	$4.571 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	2.048				2.048	$8.959 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	1.764				1.764	$1.425 \times 10^1$		
80.0 MeV	$1.527 \times 10^2$	1.349				1.349	$4.097 \times 10^1$		
100. MeV	$1.764 \times 10^2$	1.275				1.275	$5.626 \times 10^1$		
140. MeV	$2.218 \times 10^2$	1.205				1.205	$8.866 \times 10^1$		
200. MeV	$2.868 \times 10^2$	1.172				1.172	$1.393 \times 10^2$		
237. MeV	$3.260 \times 10^2$	1.168	0.000			1.169	<i>Minimum ionization</i>		
300. MeV	$3.917 \times 10^2$	1.173	0.000		0.000	1.174	$2.248 \times 10^2$		
400. MeV	$4.945 \times 10^2$	1.193	0.000		0.000	1.193	$3.093 \times 10^2$		
800. MeV	$8.995 \times 10^2$	1.276	0.001		0.000	1.277	$6.329 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	1.309	0.001		0.000	1.311	$7.874 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	1.362	0.002	0.000	0.001	1.365	$1.086 \times 10^3$		
2.00 GeV	$2.103 \times 10^3$	1.420	0.003	0.001	0.001	1.426	$1.515 \times 10^3$		
3.00 GeV	$3.104 \times 10^3$	1.486	0.006	0.003	0.001	1.497	$2.199 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	1.531	0.009	0.006	0.002	1.548	$2.855 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	1.635	0.022	0.020	0.003	1.680	$5.325 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	1.666	0.029	0.028	0.004	1.728	$6.499 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	1.711	0.044	0.046	0.005	1.807	$8.761 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	1.755	0.068	0.076	0.007	1.908	$1.199 \times 10^4$		
30.0 GeV	$3.011 \times 10^4$	1.803	0.112	0.132	0.011	2.059	$1.703 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	1.834	0.158	0.195	0.014	2.202	$2.173 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	1.903	0.358	0.469	0.028	2.760	$3.791 \times 10^4$		
100. GeV	$1.001 \times 10^5$	1.924	0.464	0.617	0.035	3.041	$4.481 \times 10^4$		
140. GeV	$1.401 \times 10^5$	1.954	0.681	0.921	0.049	3.606	$5.688 \times 10^4$		
163. GeV	$1.630 \times 10^5$	1.967	0.809	1.102	0.057	3.936	<i>Muon critical energy</i>		
200. GeV	$2.001 \times 10^5$	1.985	1.020	1.403	0.070	4.479	$7.179 \times 10^4$		
300. GeV	$3.001 \times 10^5$	2.019	1.600	2.208	0.104	5.933	$9.114 \times 10^4$		
400. GeV	$4.001 \times 10^5$	2.043	2.199	3.042	0.139	7.424	$1.062 \times 10^5$		
800. GeV	$8.001 \times 10^5$	2.101	4.670	6.461	0.281	13.515	$1.456 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	2.120	5.939	8.210	0.353	16.624	$1.589 \times 10^5$		
1.40 TeV	$1.400 \times 10^6$	2.149	8.482	11.697	0.500	22.830	$1.793 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	2.180	12.371	17.018	0.723	32.294	$2.013 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	2.215	18.861	25.861	1.106	48.044	$2.266 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	2.241	25.436	34.796	1.494	63.968	$2.445 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	2.304	51.934	70.711	3.102	128.053	$2.879 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	2.325	65.284	88.762	3.928	160.300	$3.018 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	2.356	91.911	124.781	5.622	224.673	$3.228 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	2.390	132.080	179.038	8.218	321.728	$3.450 \times 10^5$		
30.0 TeV	$3.000 \times 10^7$	2.430	198.951	269.308	12.700	483.391	$3.702 \times 10^5$		
40.0 TeV	$4.000 \times 10^7$	2.458	266.054	359.789	17.286	645.589	$3.880 \times 10^5$		
80.0 TeV	$8.000 \times 10^7$	2.528	534.841	721.955	36.427	1295.754	$4.309 \times 10^5$		
100. TeV	$1.000 \times 10^8$	2.551	669.450	903.200	46.310	1621.513	$4.446 \times 10^5$		