

## Muons in photographic emulsion

	$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
	0.45453	3.815	331.0	0.12399	3.0094	0.1009	3.4866	5.3319	0.00
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]		
				[MeV cm <sup>2</sup> /g]					
10.0 MeV	$4.704 \times 10^1$	5.269				5.269		$1.067 \times 10^0$	
14.0 MeV	$5.616 \times 10^1$	4.147				4.147		$1.932 \times 10^0$	
20.0 MeV	$6.802 \times 10^1$	3.266				3.266		$3.580 \times 10^0$	
30.0 MeV	$8.509 \times 10^1$	2.556				2.556		$7.088 \times 10^0$	
40.0 MeV	$1.003 \times 10^2$	2.195				2.195		$1.134 \times 10^1$	
80.0 MeV	$1.527 \times 10^2$	1.667				1.667		$3.288 \times 10^1$	
100. MeV	$1.764 \times 10^2$	1.572				1.572		$4.527 \times 10^1$	
140. MeV	$2.218 \times 10^2$	1.478				1.479		$7.162 \times 10^1$	
200. MeV	$2.868 \times 10^2$	1.431				1.431		$1.130 \times 10^2$	
257. MeV	$3.471 \times 10^2$	1.422			0.000	1.422		<i>Minimum ionization</i>	
300. MeV	$3.917 \times 10^2$	1.424	0.000		0.000	1.425		$1.832 \times 10^2$	
400. MeV	$4.945 \times 10^2$	1.441	0.000		0.000	1.442		$2.531 \times 10^2$	
800. MeV	$8.995 \times 10^2$	1.527	0.001		0.000	1.528		$5.223 \times 10^2$	
1.00 GeV	$1.101 \times 10^3$	1.562	0.001		0.000	1.563		$6.517 \times 10^2$	
1.40 GeV	$1.502 \times 10^3$	1.618	0.001	0.000	0.001	1.620		$9.029 \times 10^2$	
2.00 GeV	$2.103 \times 10^3$	1.678	0.002	0.001	0.001	1.682		$1.266 \times 10^3$	
3.00 GeV	$3.104 \times 10^3$	1.747	0.004	0.002	0.001	1.755		$1.847 \times 10^3$	
4.00 GeV	$4.104 \times 10^3$	1.795	0.005	0.004	0.002	1.806		$2.408 \times 10^3$	
8.00 GeV	$8.105 \times 10^3$	1.903	0.013	0.013	0.003	1.932		$4.542 \times 10^3$	
10.0 GeV	$1.011 \times 10^4$	1.935	0.017	0.018	0.004	1.975		$5.565 \times 10^3$	
14.0 GeV	$1.411 \times 10^4$	1.982	0.026	0.029	0.006	2.043		$7.555 \times 10^3$	
20.0 GeV	$2.011 \times 10^4$	2.028	0.041	0.047	0.008	2.125		$1.043 \times 10^4$	
30.0 GeV	$3.011 \times 10^4$	2.077	0.067	0.082	0.012	2.239		$1.501 \times 10^4$	
40.0 GeV	$4.011 \times 10^4$	2.110	0.095	0.121	0.016	2.342		$1.938 \times 10^4$	
80.0 GeV	$8.011 \times 10^4$	2.183	0.214	0.290	0.031	2.718		$3.520 \times 10^4$	
100. GeV	$1.001 \times 10^5$	2.205	0.277	0.381	0.038	2.902		$4.232 \times 10^4$	
140. GeV	$1.401 \times 10^5$	2.238	0.407	0.568	0.053	3.267		$5.531 \times 10^4$	
200. GeV	$2.001 \times 10^5$	2.272	0.610	0.866	0.075	3.823		$7.227 \times 10^4$	
286. GeV	$2.858 \times 10^5$	2.305	0.907	1.291	0.107	4.611		<i>Muon critical energy</i>	
300. GeV	$3.001 \times 10^5$	2.309	0.958	1.363	0.112	4.744		$9.572 \times 10^4$	
400. GeV	$4.001 \times 10^5$	2.336	1.317	1.879	0.150	5.683		$1.150 \times 10^5$	
800. GeV	$8.001 \times 10^5$	2.401	2.803	3.996	0.302	9.504		$1.688 \times 10^5$	
1.00 TeV	$1.000 \times 10^6$	2.422	3.567	5.081	0.380	11.451		$1.880 \times 10^5$	
1.40 TeV	$1.400 \times 10^6$	2.455	5.099	7.244	0.538	15.336		$2.181 \times 10^5$	
2.00 TeV	$2.000 \times 10^6$	2.489	7.443	10.546	0.779	21.258		$2.512 \times 10^5$	
3.00 TeV	$3.000 \times 10^6$	2.529	11.359	16.035	1.192	31.115		$2.898 \times 10^5$	
4.00 TeV	$4.000 \times 10^6$	2.558	15.329	21.583	1.611	41.082		$3.177 \times 10^5$	
8.00 TeV	$8.000 \times 10^6$	2.628	31.345	43.894	3.351	81.219		$3.856 \times 10^5$	
10.0 TeV	$1.000 \times 10^7$	2.651	39.419	55.111	4.245	101.428		$4.076 \times 10^5$	
14.0 TeV	$1.400 \times 10^7$	2.687	55.525	77.490	6.083	141.786		$4.408 \times 10^5$	
20.0 TeV	$2.000 \times 10^7$	2.725	79.833	111.206	8.902	202.667		$4.761 \times 10^5$	
30.0 TeV	$3.000 \times 10^7$	2.769	120.301	167.305	13.778	304.154		$5.161 \times 10^5$	
40.0 TeV	$4.000 \times 10^7$	2.801	160.924	223.543	18.772	406.041		$5.444 \times 10^5$	
80.0 TeV	$8.000 \times 10^7$	2.879	323.680	448.657	39.652	814.869		$6.126 \times 10^5$	
100. TeV	$1.000 \times 10^8$	2.905	405.207	561.321	50.445	1019.879		$6.345 \times 10^5$	