

Muons in skin (ICRP)

| | $\langle Z/A \rangle$ | ρ [g/cm ³] | I [eV] | a | $k = m_s$ | x_0 | x_1 | \bar{C} | δ_0 |
|----------|-----------------------|-----------------------------|----------|--------------------------|-----------|---------|------------------------------------|-----------|-----------------------------|
| | 0.54932 | 1.100 | 72.7 | 0.09459 | 3.4643 | 0.2019 | 2.7526 | 3.3546 | 0.00 |
| 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 | 7.914 | | | | 7.914 | | | 6.982×10^{-1} |
| 14.0 MeV | 5.616×10^1 | 6.172 | | | | 6.172 | | | 1.277×10^0 |
| 20.0 MeV | 6.802×10^1 | 4.820 | | | | 4.820 | | | 2.389×10^0 |
| 30.0 MeV | 8.509×10^1 | 3.738 | | | | 3.739 | | | 4.778×10^0 |
| 40.0 MeV | 1.003×10^2 | 3.192 | | | | 3.192 | | | 7.692×10^0 |
| 80.0 MeV | 1.527×10^2 | 2.396 | | | | 2.396 | | | 2.262×10^1 |
| 100. MeV | 1.764×10^2 | 2.250 | | | | 2.250 | | | 3.125×10^1 |
| 140. MeV | 2.218×10^2 | 2.095 | | | | 2.095 | | | 4.976×10^1 |
| 200. MeV | 2.868×10^2 | 2.005 | | | | 2.005 | | | 7.916×10^1 |
| 300. MeV | 3.917×10^2 | 1.970 | | | 0.000 | 1.970 | | | 1.296×10^2 |
| 318. MeV | 4.105×10^2 | 1.969 | | | 0.000 | 1.970 | | | <i>Minimum ionization</i> |
| 400. MeV | 4.945×10^2 | 1.976 | | | 0.000 | 1.976 | | | 1.803×10^2 |
| 800. MeV | 8.995×10^2 | 2.049 | 0.000 | | 0.000 | 2.050 | | | 3.792×10^2 |
| 1.00 GeV | 1.101×10^3 | 2.083 | 0.000 | | 0.000 | 2.084 | | | 4.759×10^2 |
| 1.40 GeV | 1.502×10^3 | 2.138 | 0.000 | | 0.001 | 2.139 | | | 6.653×10^2 |
| 2.00 GeV | 2.103×10^3 | 2.199 | 0.001 | 0.000 | 0.001 | 2.201 | | | 9.416×10^2 |
| 3.00 GeV | 3.104×10^3 | 2.268 | 0.001 | 0.001 | 0.001 | 2.271 | | | 1.388×10^3 |
| 4.00 GeV | 4.104×10^3 | 2.316 | 0.001 | 0.001 | 0.002 | 2.321 | | | 1.824×10^3 |
| 8.00 GeV | 8.105×10^3 | 2.426 | 0.003 | 0.003 | 0.004 | 2.437 | | | 3.500×10^3 |
| 10.0 GeV | 1.011×10^4 | 2.460 | 0.005 | 0.005 | 0.005 | 2.474 | | | 4.315×10^3 |
| 14.0 GeV | 1.411×10^4 | 2.509 | 0.007 | 0.008 | 0.007 | 2.530 | | | 5.913×10^3 |
| 20.0 GeV | 2.011×10^4 | 2.558 | 0.011 | 0.012 | 0.009 | 2.590 | | | 8.255×10^3 |
| 30.0 GeV | 3.011×10^4 | 2.611 | 0.018 | 0.022 | 0.014 | 2.664 | | | 1.206×10^4 |
| 40.0 GeV | 4.011×10^4 | 2.647 | 0.025 | 0.032 | 0.018 | 2.722 | | | 1.577×10^4 |
| 80.0 GeV | 8.011×10^4 | 2.730 | 0.058 | 0.077 | 0.034 | 2.899 | | | 2.999×10^4 |
| 100. GeV | 1.001×10^5 | 2.756 | 0.075 | 0.102 | 0.042 | 2.975 | | | 3.679×10^4 |
| 140. GeV | 1.401×10^5 | 2.794 | 0.110 | 0.153 | 0.059 | 3.117 | | | 4.992×10^4 |
| 200. GeV | 2.001×10^5 | 2.834 | 0.166 | 0.235 | 0.084 | 3.319 | | | 6.857×10^4 |
| 300. GeV | 3.001×10^5 | 2.880 | 0.262 | 0.373 | 0.125 | 3.641 | | | 9.732×10^4 |
| 400. GeV | 4.001×10^5 | 2.912 | 0.362 | 0.518 | 0.167 | 3.959 | | | 1.237×10^5 |
| 800. GeV | 8.001×10^5 | 2.991 | 0.777 | 1.118 | 0.338 | 5.224 | | | 2.113×10^5 |
| 1.00 TeV | 1.000×10^6 | 3.016 | 0.992 | 1.429 | 0.424 | 5.862 | | | 2.474×10^5 |
| 1.06 TeV | 1.059×10^6 | 3.023 | 1.054 | 1.518 | 0.450 | 6.046 | | | <i>Muon critical energy</i> |
| 1.40 TeV | 1.400×10^6 | 3.055 | 1.424 | 2.046 | 0.602 | 7.128 | | | 3.092×10^5 |
| 2.00 TeV | 2.000×10^6 | 3.097 | 2.089 | 2.993 | 0.871 | 9.051 | | | 3.838×10^5 |
| 3.00 TeV | 3.000×10^6 | 3.145 | 3.203 | 4.570 | 1.335 | 12.253 | | | 4.784×10^5 |
| 4.00 TeV | 4.000×10^6 | 3.180 | 4.336 | 6.168 | 1.807 | 15.492 | | | 5.508×10^5 |
| 8.00 TeV | 8.000×10^6 | 3.265 | 8.926 | 12.607 | 3.773 | 28.571 | | | 7.381×10^5 |
| 10.0 TeV | 1.000×10^7 | 3.293 | 11.248 | 15.850 | 4.785 | 35.176 | | | 8.011×10^5 |
| 14.0 TeV | 1.400×10^7 | 3.336 | 15.881 | 22.312 | 6.871 | 48.400 | | | 8.976×10^5 |
| 20.0 TeV | 2.000×10^7 | 3.382 | 22.891 | 32.058 | 10.077 | 68.408 | | | 1.001×10^6 |
| 30.0 TeV | 3.000×10^7 | 3.435 | 34.564 | 48.274 | 15.641 | 101.915 | | | 1.120×10^6 |
| 40.0 TeV | 4.000×10^7 | 3.474 | 46.300 | 64.543 | 21.353 | 135.670 | | | 1.205×10^6 |
| 80.0 TeV | 8.000×10^7 | 3.568 | 93.370 | 129.672 | 45.326 | 271.936 | | | 1.409×10^6 |
| 100. TeV | 1.000×10^8 | 3.600 | 116.972 | 162.275 | 57.754 | 340.600 | | | 1.475×10^6 |