

Table 093: Muons in Neptunium

| Z | A [g/mol] | ρ [g/cm ³] | I [eV] | a | $k = m_s$ | x_0 | x_1 | \bar{C} | δ_0 |
|----------|---------------------|-----------------------------|---------|---------------------------------------|-----------|----------|------------------------------------|-----------|------------|
| 93 (Np) | [237.04817 (2)] | 20.250 | 902.0 | 0.19741 | 2.8082 | 0.1869 | 3.3690 | 5.8149 | 0.14 |
| T | p [MeV/c] | Ionization | Brems | Pair prod [MeV cm ² /g] | Photonucl | Total | CSDA range [g/cm ²] | | |
| 10.0 MeV | 4.704×10^1 | 3.707 | | | | 3.707 | 1.578×10^0 | | |
| 14.0 MeV | 5.616×10^1 | 2.967 | | | | 2.968 | 2.795×10^0 | | |
| 20.0 MeV | 6.802×10^1 | 2.370 | | | | 2.370 | 5.080×10^0 | | |
| 30.0 MeV | 8.509×10^1 | 1.878 | | | | 1.878 | 9.879×10^0 | | |
| 40.0 MeV | 1.003×10^2 | 1.623 | | | | 1.623 | 1.564×10^1 | | |
| 80.0 MeV | 1.527×10^2 | 1.249 | | | | 1.249 | 4.456×10^1 | | |
| 100. MeV | 1.764×10^2 | 1.183 | | | | 1.183 | 6.106×10^1 | | |
| 140. MeV | 2.218×10^2 | 1.123 | | | | 1.123 | 9.590×10^1 | | |
| 200. MeV | 2.868×10^2 | 1.096 | | | | 1.097 | 1.502×10^2 | | |
| 227. MeV | 3.154×10^2 | 1.095 | 0.000 | | | 1.095 | <i>Minimum ionization</i> | | |
| 300. MeV | 3.917×10^2 | 1.102 | 0.000 | | 0.000 | 1.102 | 2.413×10^2 | | |
| 400. MeV | 4.945×10^2 | 1.122 | 0.000 | | 0.000 | 1.123 | 3.312×10^2 | | |
| 800. MeV | 8.995×10^2 | 1.205 | 0.001 | | 0.000 | 1.207 | 6.743×10^2 | | |
| 1.00 GeV | 1.101×10^3 | 1.237 | 0.002 | | 0.000 | 1.240 | 8.377×10^2 | | |
| 1.40 GeV | 1.502×10^3 | 1.289 | 0.003 | | 0.001 | 1.292 | 1.153×10^3 | | |
| 2.00 GeV | 2.103×10^3 | 1.344 | 0.004 | 0.001 | 0.001 | 1.350 | 1.607×10^3 | | |
| 3.00 GeV | 3.104×10^3 | 1.406 | 0.008 | 0.003 | 0.001 | 1.418 | 2.329×10^3 | | |
| 4.00 GeV | 4.104×10^3 | 1.449 | 0.011 | 0.006 | 0.002 | 1.468 | 3.021×10^3 | | |
| 8.00 GeV | 8.105×10^3 | 1.545 | 0.028 | 0.023 | 0.003 | 1.600 | 5.621×10^3 | | |
| 10.0 GeV | 1.011×10^4 | 1.574 | 0.037 | 0.033 | 0.004 | 1.649 | 6.852×10^3 | | |
| 14.0 GeV | 1.411×10^4 | 1.616 | 0.056 | 0.054 | 0.005 | 1.733 | 9.217×10^3 | | |
| 20.0 GeV | 2.011×10^4 | 1.657 | 0.088 | 0.090 | 0.007 | 1.843 | 1.257×10^4 | | |
| 30.0 GeV | 3.011×10^4 | 1.700 | 0.144 | 0.159 | 0.011 | 2.015 | 1.776×10^4 | | |
| 40.0 GeV | 4.011×10^4 | 1.729 | 0.203 | 0.236 | 0.014 | 2.183 | 2.252×10^4 | | |
| 80.0 GeV | 8.011×10^4 | 1.793 | 0.460 | 0.573 | 0.027 | 2.855 | 3.850×10^4 | | |
| 100. GeV | 1.001×10^5 | 1.812 | 0.596 | 0.755 | 0.034 | 3.199 | 4.512×10^4 | | |
| 127. GeV | 1.271×10^5 | 1.832 | 0.783 | 1.006 | 0.043 | 3.666 | <i>Muon critical energy</i> | | |
| 140. GeV | 1.401×10^5 | 1.840 | 0.875 | 1.130 | 0.047 | 3.894 | 5.644×10^4 | | |
| 200. GeV | 2.001×10^5 | 1.869 | 1.312 | 1.725 | 0.067 | 4.974 | 7.005×10^4 | | |
| 300. GeV | 3.001×10^5 | 1.902 | 2.056 | 2.717 | 0.101 | 6.777 | 8.721×10^4 | | |
| 400. GeV | 4.001×10^5 | 1.925 | 2.824 | 3.746 | 0.135 | 8.631 | 1.003×10^5 | | |
| 800. GeV | 8.001×10^5 | 1.981 | 5.995 | 7.962 | 0.272 | 16.212 | 1.336×10^5 | | |
| 1.00 TeV | 1.000×10^6 | 1.999 | 7.622 | 10.119 | 0.342 | 20.084 | 1.446×10^5 | | |
| 1.40 TeV | 1.400×10^6 | 2.027 | 10.880 | 14.419 | 0.485 | 27.813 | 1.615×10^5 | | |
| 2.00 TeV | 2.000×10^6 | 2.057 | 15.861 | 20.982 | 0.701 | 39.602 | 1.795×10^5 | | |
| 3.00 TeV | 3.000×10^6 | 2.091 | 24.170 | 31.884 | 1.071 | 59.218 | 2.000×10^5 | | |
| 4.00 TeV | 4.000×10^6 | 2.116 | 32.585 | 42.901 | 1.446 | 79.051 | 2.146×10^5 | | |
| 8.00 TeV | 8.000×10^6 | 2.177 | 66.487 | 87.181 | 3.002 | 158.849 | 2.495×10^5 | | |
| 10.0 TeV | 1.000×10^7 | 2.197 | 83.561 | 109.435 | 3.801 | 198.996 | 2.608×10^5 | | |
| 14.0 TeV | 1.400×10^7 | 2.227 | 117.615 | 153.842 | 5.438 | 279.125 | 2.777×10^5 | | |
| 20.0 TeV | 2.000×10^7 | 2.260 | 168.976 | 220.732 | 7.946 | 399.916 | 2.955×10^5 | | |
| 30.0 TeV | 3.000×10^7 | 2.298 | 254.563 | 332.013 | 12.277 | 601.154 | 3.158×10^5 | | |
| 40.0 TeV | 4.000×10^7 | 2.326 | 340.457 | 443.549 | 16.709 | 803.043 | 3.301×10^5 | | |
| 80.0 TeV | 8.000×10^7 | 2.393 | 684.014 | 890.002 | 35.192 | 1611.604 | 3.646×10^5 | | |
| 100. TeV | 1.000×10^8 | 2.416 | 855.900 | 1113.430 | 44.730 | 2016.478 | 3.757×10^5 | | |