## Table 286: Muons in Liquid fluorine ($F_2$)

| Z | $A$ [g/mol] | $\rho$ [g/cm$^3$] | $I$ [eV] | $a$ | $k = m_s$ | $x_0$ | $x_1$ | $\overline{C}$ | $\delta_0$ |
|---|---|---|---|---|---|---|---|---|---|
| 9 (F) | 18.9984032 (5) | 1.507 | 115.0 | 0.14504 | 3.0000 | 0.2000 | 3.0000 | 4.1050 | 0.00 |

| $T$ | $p$ [MeV/$c$] | Ionization | Brems | Pair prod | Photonucl | Total | CSDA range [g/cm$^2$] |
|---|---|---|---|---|---|---|---|
| | | [MeV cm$^2$/g] | | | | | |
| 10.0 MeV | $4.704 \times 10^1$ | 6.415 | | | | 6.415 | $8.662 \times 10^{-1}$ |
| 14.0 MeV | $5.616 \times 10^1$ | 5.017 | | | | 5.017 | $1.579 \times 10^0$ |
| 20.0 MeV | $6.802 \times 10^1$ | 3.927 | | | | 3.927 | $2.946 \times 10^0$ |
| 30.0 MeV | $8.509 \times 10^1$ | 3.054 | | | | 3.054 | $5.874 \times 10^0$ |
| 40.0 MeV | $1.003 \times 10^2$ | 2.611 | | | | 2.611 | $9.438 \times 10^0$ |
| 80.0 MeV | $1.527 \times 10^2$ | 1.967 | | | | 1.967 | $2.764 \times 10^1$ |
| 100. MeV | $1.764 \times 10^2$ | 1.850 | | | | 1.850 | $3.815 \times 10^1$ |
| 140. MeV | $2.218 \times 10^2$ | 1.726 | | | | 1.726 | $6.064 \times 10^1$ |
| 200. MeV | $2.868 \times 10^2$ | 1.657 | | | | 1.657 | $9.626 \times 10^1$ |
| 298. MeV | $3.894 \times 10^2$ | 1.634 | | | 0.000 | 1.634 | *Minimum ionization* |
| 300. MeV | $3.917 \times 10^2$ | 1.634 | | | 0.000 | 1.634 | $1.572 \times 10^2$ |
| 400. MeV | $4.945 \times 10^2$ | 1.643 | | | 0.000 | 1.643 | $2.183 \times 10^2$ |
| 800. MeV | $8.995 \times 10^2$ | 1.716 | 0.000 | | 0.000 | 1.717 | $4.565 \times 10^2$ |
| 1.00 GeV | $1.101 \times 10^3$ | 1.748 | 0.000 | | 0.000 | 1.749 | $5.719 \times 10^2$ |
| 1.40 GeV | $1.502 \times 10^3$ | 1.800 | 0.000 | 0.000 | 0.001 | 1.801 | $7.971 \times 10^2$ |
| 2.00 GeV | $2.103 \times 10^3$ | 1.857 | 0.001 | 0.000 | 0.001 | 1.859 | $1.125 \times 10^3$ |
| 3.00 GeV | $3.104 \times 10^3$ | 1.922 | 0.001 | 0.001 | 0.001 | 1.926 | $1.653 \times 10^3$ |
| 4.00 GeV | $4.104 \times 10^3$ | 1.967 | 0.002 | 0.001 | 0.002 | 1.972 | $2.165 \times 10^3$ |
| 8.00 GeV | $8.105 \times 10^3$ | 2.070 | 0.004 | 0.004 | 0.004 | 2.082 | $4.133 \times 10^3$ |
| 10.0 GeV | $1.011 \times 10^4$ | 2.101 | 0.005 | 0.005 | 0.005 | 2.117 | $5.085 \times 10^3$ |
| 14.0 GeV | $1.411 \times 10^4$ | 2.146 | 0.008 | 0.009 | 0.006 | 2.169 | $6.951 \times 10^3$ |
| 20.0 GeV | $2.011 \times 10^4$ | 2.190 | 0.013 | 0.015 | 0.009 | 2.227 | $9.679 \times 10^3$ |
| 30.0 GeV | $3.011 \times 10^4$ | 2.238 | 0.021 | 0.026 | 0.013 | 2.298 | $1.410 \times 10^4$ |
| 40.0 GeV | $4.011 \times 10^4$ | 2.270 | 0.030 | 0.038 | 0.017 | 2.354 | $1.839 \times 10^4$ |
| 80.0 GeV | $8.011 \times 10^4$ | 2.342 | 0.067 | 0.091 | 0.033 | 2.534 | $3.474 \times 10^4$ |
| 100. GeV | $1.001 \times 10^5$ | 2.364 | 0.087 | 0.120 | 0.041 | 2.613 | $4.251 \times 10^4$ |
| 140. GeV | $1.401 \times 10^5$ | 2.397 | 0.129 | 0.180 | 0.057 | 2.764 | $5.739 \times 10^4$ |
| 200. GeV | $2.001 \times 10^5$ | 2.432 | 0.194 | 0.275 | 0.082 | 2.983 | $7.828 \times 10^4$ |
| 300. GeV | $3.001 \times 10^5$ | 2.471 | 0.305 | 0.436 | 0.122 | 3.336 | $1.100 \times 10^5$ |
| 400. GeV | $4.001 \times 10^5$ | 2.499 | 0.421 | 0.604 | 0.163 | 3.687 | $1.385 \times 10^5$ |
| 800. GeV | $8.001 \times 10^5$ | 2.567 | 0.901 | 1.301 | 0.329 | 5.099 | $2.303 \times 10^5$ |
| 811. GeV | $8.109 \times 10^5$ | 2.568 | 0.914 | 1.320 | 0.334 | 5.137 | *Muon critical energy* |
| 1.00 TeV | $1.000 \times 10^6$ | 2.589 | 1.149 | 1.661 | 0.414 | 5.813 | $2.670 \times 10^5$ |
| 1.40 TeV | $1.400 \times 10^6$ | 2.623 | 1.648 | 2.375 | 0.587 | 7.233 | $3.286 \times 10^5$ |
| 2.00 TeV | $2.000 \times 10^6$ | 2.659 | 2.413 | 3.470 | 0.850 | 9.392 | $4.012 \times 10^5$ |
| 3.00 TeV | $3.000 \times 10^6$ | 2.700 | 3.695 | 5.292 | 1.301 | 12.989 | $4.914 \times 10^5$ |
| 4.00 TeV | $4.000 \times 10^6$ | 2.730 | 4.998 | 7.138 | 1.761 | 16.627 | $5.593 \times 10^5$ |
| 8.00 TeV | $8.000 \times 10^6$ | 2.804 | 10.269 | 14.569 | 3.672 | 31.314 | $7.318 \times 10^5$ |
| 10.0 TeV | $1.000 \times 10^7$ | 2.828 | 12.932 | 18.311 | 4.656 | 38.727 | $7.891 \times 10^5$ |
| 14.0 TeV | $1.400 \times 10^7$ | 2.865 | 18.245 | 25.768 | 6.682 | 53.559 | $8.766 \times 10^5$ |
| 20.0 TeV | $2.000 \times 10^7$ | 2.904 | 26.276 | 37.012 | 9.792 | 75.985 | $9.702 \times 10^5$ |
| 30.0 TeV | $3.000 \times 10^7$ | 2.950 | 39.648 | 55.724 | 15.187 | 113.509 | $1.077 \times 10^6$ |
| 40.0 TeV | $4.000 \times 10^7$ | 2.983 | 53.085 | 74.493 | 20.722 | 151.283 | $1.153 \times 10^6$ |
| 80.0 TeV | $8.000 \times 10^7$ | 3.065 | 106.962 | 149.635 | 43.923 | 303.586 | $1.336 \times 10^6$ |
| 100. TeV | $1.000 \times 10^8$ | 3.092 | 133.970 | 187.250 | 55.940 | 380.252 | $1.395 \times 10^6$ |