

**Table 066: Muons in Dysprosium**

| Z        | A [g/mol]           | $\rho$ [g/cm <sup>3</sup> ] | I [eV]  | a                                     | $k = m_s$ | $x_0$    | $x_1$                              | $\bar{C}$ | $\delta_0$ |
|----------|---------------------|-----------------------------|---------|---------------------------------------|-----------|----------|------------------------------------|-----------|------------|
| 66 (Dy)  | 162.500 (1)         | 8.550                       | 628.0   | 0.24665                               | 2.5849    | 0.0822   | 3.4474                             | 5.9183    | 0.14       |
| T        | p<br>[MeV/c]        | Ionization                  | Brems   | Pair prod<br>[MeV cm <sup>2</sup> /g] | Photonucl | Total    | CSDA range<br>[g/cm <sup>2</sup> ] |           |            |
| 10.0 MeV | $4.704 \times 10^1$ | 4.162                       |         |                                       |           | 4.162    | $1.381 \times 10^0$                |           |            |
| 14.0 MeV | $5.616 \times 10^1$ | 3.304                       |         |                                       |           | 3.304    | $2.469 \times 10^0$                |           |            |
| 20.0 MeV | $6.802 \times 10^1$ | 2.621                       |         |                                       |           | 2.621    | $4.530 \times 10^0$                |           |            |
| 30.0 MeV | $8.509 \times 10^1$ | 2.063                       |         |                                       |           | 2.063    | $8.887 \times 10^0$                |           |            |
| 40.0 MeV | $1.003 \times 10^2$ | 1.776                       |         |                                       |           | 1.776    | $1.414 \times 10^1$                |           |            |
| 80.0 MeV | $1.527 \times 10^2$ | 1.357                       |         |                                       |           | 1.357    | $4.069 \times 10^1$                |           |            |
| 100. MeV | $1.764 \times 10^2$ | 1.283                       |         |                                       |           | 1.283    | $5.589 \times 10^1$                |           |            |
| 140. MeV | $2.218 \times 10^2$ | 1.212                       |         |                                       |           | 1.212    | $8.810 \times 10^1$                |           |            |
| 200. MeV | $2.868 \times 10^2$ | 1.179                       |         |                                       |           | 1.179    | $1.384 \times 10^2$                |           |            |
| 239. MeV | $3.285 \times 10^2$ | 1.175                       | 0.000   |                                       |           | 1.176    | <i>Minimum ionization</i>          |           |            |
| 300. MeV | $3.917 \times 10^2$ | 1.180                       | 0.000   |                                       | 0.000     | 1.181    | $2.234 \times 10^2$                |           |            |
| 400. MeV | $4.945 \times 10^2$ | 1.199                       | 0.000   |                                       | 0.000     | 1.200    | $3.074 \times 10^2$                |           |            |
| 800. MeV | $8.995 \times 10^2$ | 1.283                       | 0.001   |                                       | 0.000     | 1.284    | $6.292 \times 10^2$                |           |            |
| 1.00 GeV | $1.101 \times 10^3$ | 1.316                       | 0.001   |                                       | 0.000     | 1.318    | $7.829 \times 10^2$                |           |            |
| 1.40 GeV | $1.502 \times 10^3$ | 1.369                       | 0.002   | 0.000                                 | 0.001     | 1.372    | $1.080 \times 10^3$                |           |            |
| 2.00 GeV | $2.103 \times 10^3$ | 1.427                       | 0.003   | 0.001                                 | 0.001     | 1.432    | $1.508 \times 10^3$                |           |            |
| 3.00 GeV | $3.104 \times 10^3$ | 1.492                       | 0.006   | 0.003                                 | 0.001     | 1.503    | $2.188 \times 10^3$                |           |            |
| 4.00 GeV | $4.104 \times 10^3$ | 1.537                       | 0.009   | 0.006                                 | 0.002     | 1.554    | $2.842 \times 10^3$                |           |            |
| 8.00 GeV | $8.105 \times 10^3$ | 1.640                       | 0.021   | 0.020                                 | 0.003     | 1.684    | $5.305 \times 10^3$                |           |            |
| 10.0 GeV | $1.011 \times 10^4$ | 1.671                       | 0.028   | 0.028                                 | 0.004     | 1.731    | $6.475 \times 10^3$                |           |            |
| 14.0 GeV | $1.411 \times 10^4$ | 1.715                       | 0.043   | 0.045                                 | 0.005     | 1.809    | $8.734 \times 10^3$                |           |            |
| 20.0 GeV | $2.011 \times 10^4$ | 1.760                       | 0.067   | 0.074                                 | 0.007     | 1.908    | $1.196 \times 10^4$                |           |            |
| 30.0 GeV | $3.011 \times 10^4$ | 1.806                       | 0.109   | 0.129                                 | 0.011     | 2.056    | $1.701 \times 10^4$                |           |            |
| 40.0 GeV | $4.011 \times 10^4$ | 1.837                       | 0.154   | 0.190                                 | 0.014     | 2.197    | $2.171 \times 10^4$                |           |            |
| 80.0 GeV | $8.011 \times 10^4$ | 1.906                       | 0.348   | 0.457                                 | 0.028     | 2.740    | $3.797 \times 10^4$                |           |            |
| 100. GeV | $1.001 \times 10^5$ | 1.926                       | 0.451   | 0.602                                 | 0.035     | 3.015    | $4.493 \times 10^4$                |           |            |
| 140. GeV | $1.401 \times 10^5$ | 1.956                       | 0.662   | 0.898                                 | 0.049     | 3.566    | $5.712 \times 10^4$                |           |            |
| 167. GeV | $1.669 \times 10^5$ | 1.971                       | 0.808   | 1.105                                 | 0.058     | 3.943    | <i>Muon critical energy</i>        |           |            |
| 200. GeV | $2.001 \times 10^5$ | 1.986                       | 0.992   | 1.368                                 | 0.070     | 4.417    | $7.222 \times 10^4$                |           |            |
| 300. GeV | $3.001 \times 10^5$ | 2.020                       | 1.555   | 2.153                                 | 0.105     | 5.834    | $9.186 \times 10^4$                |           |            |
| 400. GeV | $4.001 \times 10^5$ | 2.044                       | 2.137   | 2.966                                 | 0.139     | 7.288    | $1.072 \times 10^5$                |           |            |
| 800. GeV | $8.001 \times 10^5$ | 2.102                       | 4.540   | 6.300                                 | 0.282     | 13.225   | $1.474 \times 10^5$                |           |            |
| 1.00 TeV | $1.000 \times 10^6$ | 2.121                       | 5.774   | 8.005                                 | 0.354     | 16.255   | $1.610 \times 10^5$                |           |            |
| 1.40 TeV | $1.400 \times 10^6$ | 2.150                       | 8.246   | 11.406                                | 0.501     | 22.305   | $1.819 \times 10^5$                |           |            |
| 2.00 TeV | $2.000 \times 10^6$ | 2.181                       | 12.027  | 16.594                                | 0.725     | 31.529   | $2.044 \times 10^5$                |           |            |
| 3.00 TeV | $3.000 \times 10^6$ | 2.216                       | 18.337  | 25.217                                | 1.109     | 46.880   | $2.303 \times 10^5$                |           |            |
| 4.00 TeV | $4.000 \times 10^6$ | 2.242                       | 24.730  | 33.930                                | 1.498     | 62.401   | $2.487 \times 10^5$                |           |            |
| 8.00 TeV | $8.000 \times 10^6$ | 2.305                       | 50.497  | 68.951                                | 3.111     | 124.866  | $2.931 \times 10^5$                |           |            |
| 10.0 TeV | $1.000 \times 10^7$ | 2.326                       | 63.479  | 86.553                                | 3.939     | 156.298  | $3.074 \times 10^5$                |           |            |
| 14.0 TeV | $1.400 \times 10^7$ | 2.357                       | 89.372  | 121.677                               | 5.638     | 219.046  | $3.289 \times 10^5$                |           |            |
| 20.0 TeV | $2.000 \times 10^7$ | 2.391                       | 128.434 | 174.586                               | 8.240     | 313.653  | $3.517 \times 10^5$                |           |            |
| 30.0 TeV | $3.000 \times 10^7$ | 2.431                       | 193.462 | 262.612                               | 12.736    | 471.242  | $3.775 \times 10^5$                |           |            |
| 40.0 TeV | $4.000 \times 10^7$ | 2.459                       | 258.717 | 350.842                               | 17.336    | 629.356  | $3.958 \times 10^5$                |           |            |
| 80.0 TeV | $8.000 \times 10^7$ | 2.529                       | 520.105 | 704.008                               | 36.531    | 1263.175 | $4.398 \times 10^5$                |           |            |
| 100. TeV | $1.000 \times 10^8$ | 2.552                       | 651.010 | 880.750                               | 46.440    | 1580.754 | $4.539 \times 10^5$                |           |            |