

**Table 113: Muons in Barium fluoride (BaF<sub>2</sub>)**

| $\langle Z/A \rangle$ | $\rho$ [g/cm <sup>3</sup> ] | $I$ [eV]   | $a$     | $k = m_s$                             | $x_0$     | $x_1$    | $\bar{C}$                          | $\delta_0$ |
|-----------------------|-----------------------------|------------|---------|---------------------------------------|-----------|----------|------------------------------------|------------|
| 0.42207               | 4.893                       | 375.9      | 0.15991 | 2.8867                                | -0.0099   | 3.3870   | 5.4116                             | 0.00       |
| $T$                   | $p$<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              | $4.704 \times 10^1$         | 4.793      |         |                                       |           | 4.793    | $1.176 \times 10^0$                |            |
| 14.0 MeV              | $5.616 \times 10^1$         | 3.776      |         |                                       |           | 3.776    | $2.125 \times 10^0$                |            |
| 20.0 MeV              | $6.802 \times 10^1$         | 2.976      |         |                                       |           | 2.976    | $3.935 \times 10^0$                |            |
| 30.0 MeV              | $8.509 \times 10^1$         | 2.331      |         |                                       |           | 2.331    | $7.782 \times 10^0$                |            |
| 40.0 MeV              | $1.003 \times 10^2$         | 2.003      |         |                                       |           | 2.003    | $1.244 \times 10^1$                |            |
| 80.0 MeV              | $1.527 \times 10^2$         | 1.523      |         |                                       |           | 1.523    | $3.604 \times 10^1$                |            |
| 100. MeV              | $1.764 \times 10^2$         | 1.437      |         |                                       |           | 1.437    | $4.959 \times 10^1$                |            |
| 140. MeV              | $2.218 \times 10^2$         | 1.352      |         |                                       |           | 1.352    | $7.841 \times 10^1$                |            |
| 200. MeV              | $2.868 \times 10^2$         | 1.310      |         |                                       |           | 1.310    | $1.236 \times 10^2$                |            |
| 256. MeV              | $3.462 \times 10^2$         | 1.303      |         |                                       | 0.000     | 1.303    | <i>Minimum ionization</i>          |            |
| 300. MeV              | $3.917 \times 10^2$         | 1.305      | 0.000   |                                       | 0.000     | 1.306    | $2.003 \times 10^2$                |            |
| 400. MeV              | $4.945 \times 10^2$         | 1.322      | 0.000   |                                       | 0.000     | 1.323    | $2.764 \times 10^2$                |            |
| 800. MeV              | $8.995 \times 10^2$         | 1.403      | 0.001   |                                       | 0.000     | 1.404    | $5.697 \times 10^2$                |            |
| 1.00 GeV              | $1.101 \times 10^3$         | 1.436      | 0.001   |                                       | 0.000     | 1.437    | $7.105 \times 10^2$                |            |
| 1.40 GeV              | $1.502 \times 10^3$         | 1.488      | 0.001   | 0.000                                 | 0.001     | 1.491    | $9.835 \times 10^2$                |            |
| 2.00 GeV              | $2.103 \times 10^3$         | 1.545      | 0.002   | 0.001                                 | 0.001     | 1.550    | $1.378 \times 10^3$                |            |
| 3.00 GeV              | $3.104 \times 10^3$         | 1.609      | 0.004   | 0.003                                 | 0.001     | 1.618    | $2.009 \times 10^3$                |            |
| 4.00 GeV              | $4.104 \times 10^3$         | 1.654      | 0.006   | 0.005                                 | 0.002     | 1.667    | $2.617 \times 10^3$                |            |
| 8.00 GeV              | $8.105 \times 10^3$         | 1.755      | 0.015   | 0.015                                 | 0.003     | 1.788    | $4.925 \times 10^3$                |            |
| 10.0 GeV              | $1.011 \times 10^4$         | 1.785      | 0.020   | 0.021                                 | 0.004     | 1.830    | $6.030 \times 10^3$                |            |
| 14.0 GeV              | $1.411 \times 10^4$         | 1.829      | 0.031   | 0.033                                 | 0.006     | 1.899    | $8.174 \times 10^3$                |            |
| 20.0 GeV              | $2.011 \times 10^4$         | 1.872      | 0.048   | 0.054                                 | 0.008     | 1.983    | $1.126 \times 10^4$                |            |
| 30.0 GeV              | $3.011 \times 10^4$         | 1.918      | 0.078   | 0.095                                 | 0.012     | 2.103    | $1.616 \times 10^4$                |            |
| 40.0 GeV              | $4.011 \times 10^4$         | 1.948      | 0.111   | 0.139                                 | 0.015     | 2.214    | $2.079 \times 10^4$                |            |
| 80.0 GeV              | $8.011 \times 10^4$         | 2.016      | 0.250   | 0.334                                 | 0.030     | 2.631    | $3.733 \times 10^4$                |            |
| 100. GeV              | $1.001 \times 10^5$         | 2.037      | 0.324   | 0.439                                 | 0.037     | 2.838    | $4.465 \times 10^4$                |            |
| 140. GeV              | $1.401 \times 10^5$         | 2.067      | 0.475   | 0.656                                 | 0.051     | 3.250    | $5.781 \times 10^4$                |            |
| 200. GeV              | $2.001 \times 10^5$         | 2.098      | 0.713   | 0.999                                 | 0.073     | 3.884    | $7.469 \times 10^4$                |            |
| 233. GeV              | $2.327 \times 10^5$         | 2.111      | 0.843   | 1.183                                 | 0.085     | 4.223    | <i>Muon critical energy</i>        |            |
| 300. GeV              | $3.001 \times 10^5$         | 2.133      | 1.118   | 1.572                                 | 0.110     | 4.934    | $9.749 \times 10^4$                |            |
| 400. GeV              | $4.001 \times 10^5$         | 2.158      | 1.537   | 2.167                                 | 0.146     | 6.009    | $1.158 \times 10^5$                |            |
| 800. GeV              | $8.001 \times 10^5$         | 2.218      | 3.268   | 4.606                                 | 0.295     | 10.389   | $1.659 \times 10^5$                |            |
| 1.00 TeV              | $1.000 \times 10^6$         | 2.238      | 4.157   | 5.855                                 | 0.371     | 12.622   | $1.833 \times 10^5$                |            |
| 1.40 TeV              | $1.400 \times 10^6$         | 2.268      | 5.940   | 8.344                                 | 0.526     | 17.079   | $2.105 \times 10^5$                |            |
| 2.00 TeV              | $2.000 \times 10^6$         | 2.300      | 8.668   | 12.145                                | 0.761     | 23.874   | $2.400 \times 10^5$                |            |
| 3.00 TeV              | $3.000 \times 10^6$         | 2.337      | 13.223  | 18.460                                | 1.163     | 35.184   | $2.743 \times 10^5$                |            |
| 4.00 TeV              | $4.000 \times 10^6$         | 2.364      | 17.839  | 24.844                                | 1.572     | 46.620   | $2.990 \times 10^5$                |            |
| 8.00 TeV              | $8.000 \times 10^6$         | 2.429      | 36.453  | 50.507                                | 3.270     | 92.659   | $3.587 \times 10^5$                |            |
| 10.0 TeV              | $1.000 \times 10^7$         | 2.451      | 45.834  | 63.408                                | 4.141     | 115.835  | $3.779 \times 10^5$                |            |
| 14.0 TeV              | $1.400 \times 10^7$         | 2.484      | 64.546  | 89.147                                | 5.932     | 162.110  | $4.070 \times 10^5$                |            |
| 20.0 TeV              | $2.000 \times 10^7$         | 2.519      | 92.781  | 127.924                               | 8.678     | 231.904  | $4.378 \times 10^5$                |            |
| 30.0 TeV              | $3.000 \times 10^7$         | 2.560      | 139.787 | 192.439                               | 13.426    | 348.213  | $4.727 \times 10^5$                |            |
| 40.0 TeV              | $4.000 \times 10^7$         | 2.589      | 186.965 | 257.109                               | 18.288    | 464.952  | $4.975 \times 10^5$                |            |
| 80.0 TeV              | $8.000 \times 10^7$         | 2.662      | 375.962 | 515.980                               | 38.604    | 933.210  | $5.570 \times 10^5$                |            |
| 100. TeV              | $1.000 \times 10^8$         | 2.686      | 470.624 | 645.539                               | 49.102    | 1167.952 | $5.761 \times 10^5$                |            |