## Muons in ag halides in phot emulsion

| $\langle Z/A \rangle$ | $\rho$ [g/cm$^3$] | $I$ [eV] | $a$ | $k = m_s$ | $x_0$ | $x_1$ | $\overline{C}$ | $\delta_0$ |
|---|---|---|---|---|---|---|---|---|
| 0.43663 | 6.470 | 487.1 | 0.24593 | 2.6814 | 0.0353 | 3.2117 | 5.6166 | 0.00 |

| $T$ | $p$ [MeV/$c$] | Ionization | Brems | Pair prod | Photonucl | Total | CSDA range [g/cm$^2$] |
|---|---|---|---|---|---|---|---|
| | | [MeV cm$^2$/g] | | | | | |
| 10.0 MeV | $4.704 \times 10^1$ | 4.749 | | | | 4.749 | $1.192 \times 10^0$ |
| 14.0 MeV | $5.616 \times 10^1$ | 3.748 | | | | 3.748 | $2.149 \times 10^0$ |
| 20.0 MeV | $6.802 \times 10^1$ | 2.960 | | | | 2.960 | $3.970 \times 10^0$ |
| 30.0 MeV | $8.509 \times 10^1$ | 2.323 | | | | 2.323 | $7.834 \times 10^0$ |
| 40.0 MeV | $1.003 \times 10^2$ | 1.999 | | | | 1.999 | $1.250 \times 10^1$ |
| 80.0 MeV | $1.527 \times 10^2$ | 1.525 | | | | 1.525 | $3.610 \times 10^1$ |
| 100. MeV | $1.764 \times 10^2$ | 1.441 | | | | 1.441 | $4.963 \times 10^1$ |
| 140. MeV | $2.218 \times 10^2$ | 1.359 | | | | 1.359 | $7.834 \times 10^1$ |
| 200. MeV | $2.868 \times 10^2$ | 1.319 | | | | 1.319 | $1.233 \times 10^2$ |
| 247. MeV | $3.366 \times 10^2$ | 1.313 | | | | 1.313 | *Minimum ionization* |
| 300. MeV | $3.917 \times 10^2$ | 1.317 | 0.000 | | 0.000 | 1.318 | $1.994 \times 10^2$ |
| 400. MeV | $4.945 \times 10^2$ | 1.336 | 0.000 | | 0.000 | 1.337 | $2.747 \times 10^2$ |
| 800. MeV | $8.995 \times 10^2$ | 1.423 | 0.001 | | 0.000 | 1.424 | $5.643 \times 10^2$ |
| 1.00 GeV | $1.101 \times 10^3$ | 1.458 | 0.001 | | 0.000 | 1.459 | $7.030 \times 10^2$ |
| 1.40 GeV | $1.502 \times 10^3$ | 1.513 | 0.001 | 0.000 | 0.001 | 1.516 | $9.718 \times 10^2$ |
| 2.00 GeV | $2.103 \times 10^3$ | 1.573 | 0.002 | 0.001 | 0.001 | 1.578 | $1.359 \times 10^3$ |
| 3.00 GeV | $3.104 \times 10^3$ | 1.641 | 0.004 | 0.003 | 0.001 | 1.650 | $1.978 \times 10^3$ |
| 4.00 GeV | $4.104 \times 10^3$ | 1.688 | 0.006 | 0.005 | 0.002 | 1.701 | $2.575 \times 10^3$ |
| 8.00 GeV | $8.105 \times 10^3$ | 1.794 | 0.015 | 0.015 | 0.003 | 1.828 | $4.835 \times 10^3$ |
| 10.0 GeV | $1.011 \times 10^4$ | 1.826 | 0.020 | 0.021 | 0.004 | 1.871 | $5.916 \times 10^3$ |
| 14.0 GeV | $1.411 \times 10^4$ | 1.871 | 0.031 | 0.034 | 0.006 | 1.941 | $8.013 \times 10^3$ |
| 20.0 GeV | $2.011 \times 10^4$ | 1.916 | 0.047 | 0.055 | 0.008 | 2.027 | $1.104 \times 10^4$ |
| 30.0 GeV | $3.011 \times 10^4$ | 1.964 | 0.078 | 0.095 | 0.012 | 2.149 | $1.582 \times 10^4$ |
| 40.0 GeV | $4.011 \times 10^4$ | 1.996 | 0.109 | 0.140 | 0.015 | 2.261 | $2.036 \times 10^4$ |
| 80.0 GeV | $8.011 \times 10^4$ | 2.066 | 0.247 | 0.335 | 0.030 | 2.678 | $3.658 \times 10^4$ |
| 100. GeV | $1.001 \times 10^5$ | 2.087 | 0.320 | 0.440 | 0.037 | 2.885 | $4.378 \times 10^4$ |
| 140. GeV | $1.401 \times 10^5$ | 2.117 | 0.470 | 0.657 | 0.051 | 3.297 | $5.674 \times 10^4$ |
| 200. GeV | $2.001 \times 10^5$ | 2.149 | 0.705 | 1.000 | 0.073 | 3.928 | $7.340 \times 10^4$ |
| 239. GeV | $2.389 \times 10^5$ | 2.165 | 0.859 | 1.220 | 0.087 | 4.332 | *Muon critical energy* |
| 300. GeV | $3.001 \times 10^5$ | 2.186 | 1.106 | 1.574 | 0.109 | 4.976 | $9.598 \times 10^4$ |
| 400. GeV | $4.001 \times 10^5$ | 2.211 | 1.521 | 2.169 | 0.146 | 6.048 | $1.142 \times 10^5$ |
| 800. GeV | $8.001 \times 10^5$ | 2.274 | 3.234 | 4.609 | 0.295 | 10.413 | $1.640 \times 10^5$ |
| 1.00 TeV | $1.000 \times 10^6$ | 2.294 | 4.115 | 5.858 | 0.370 | 12.639 | $1.814 \times 10^5$ |
| 1.40 TeV | $1.400 \times 10^6$ | 2.325 | 5.881 | 8.350 | 0.525 | 17.082 | $2.085 \times 10^5$ |
| 2.00 TeV | $2.000 \times 10^6$ | 2.358 | 8.583 | 12.154 | 0.759 | 23.856 | $2.381 \times 10^5$ |
| 3.00 TeV | $3.000 \times 10^6$ | 2.397 | 13.096 | 18.476 | 1.161 | 35.130 | $2.725 \times 10^5$ |
| 4.00 TeV | $4.000 \times 10^6$ | 2.424 | 17.670 | 24.866 | 1.569 | 46.530 | $2.971 \times 10^5$ |
| 8.00 TeV | $8.000 \times 10^6$ | 2.492 | 36.119 | 50.556 | 3.262 | 92.430 | $3.570 \times 10^5$ |
| 10.0 TeV | $1.000 \times 10^7$ | 2.514 | 45.419 | 63.472 | 4.131 | 115.537 | $3.763 \times 10^5$ |
| 14.0 TeV | $1.400 \times 10^7$ | 2.548 | 63.968 | 89.240 | 5.916 | 161.674 | $4.054 \times 10^5$ |
| 20.0 TeV | $2.000 \times 10^7$ | 2.585 | 91.961 | 128.061 | 8.653 | 231.261 | $4.363 \times 10^5$ |
| 30.0 TeV | $3.000 \times 10^7$ | 2.627 | 138.562 | 192.654 | 13.383 | 347.227 | $4.713 \times 10^5$ |
| 40.0 TeV | $4.000 \times 10^7$ | 2.658 | 185.338 | 257.403 | 18.226 | 463.625 | $4.962 \times 10^5$ |
| 80.0 TeV | $8.000 \times 10^7$ | 2.733 | 372.739 | 516.588 | 38.450 | 930.510 | $5.559 \times 10^5$ |
| 100. TeV | $1.000 \times 10^8$ | 2.758 | 466.607 | 646.302 | 48.897 | 1164.564 | $5.750 \times 10^5$ |