Precision of the muon propagation codes

MMC, MUM, LOH, LIP

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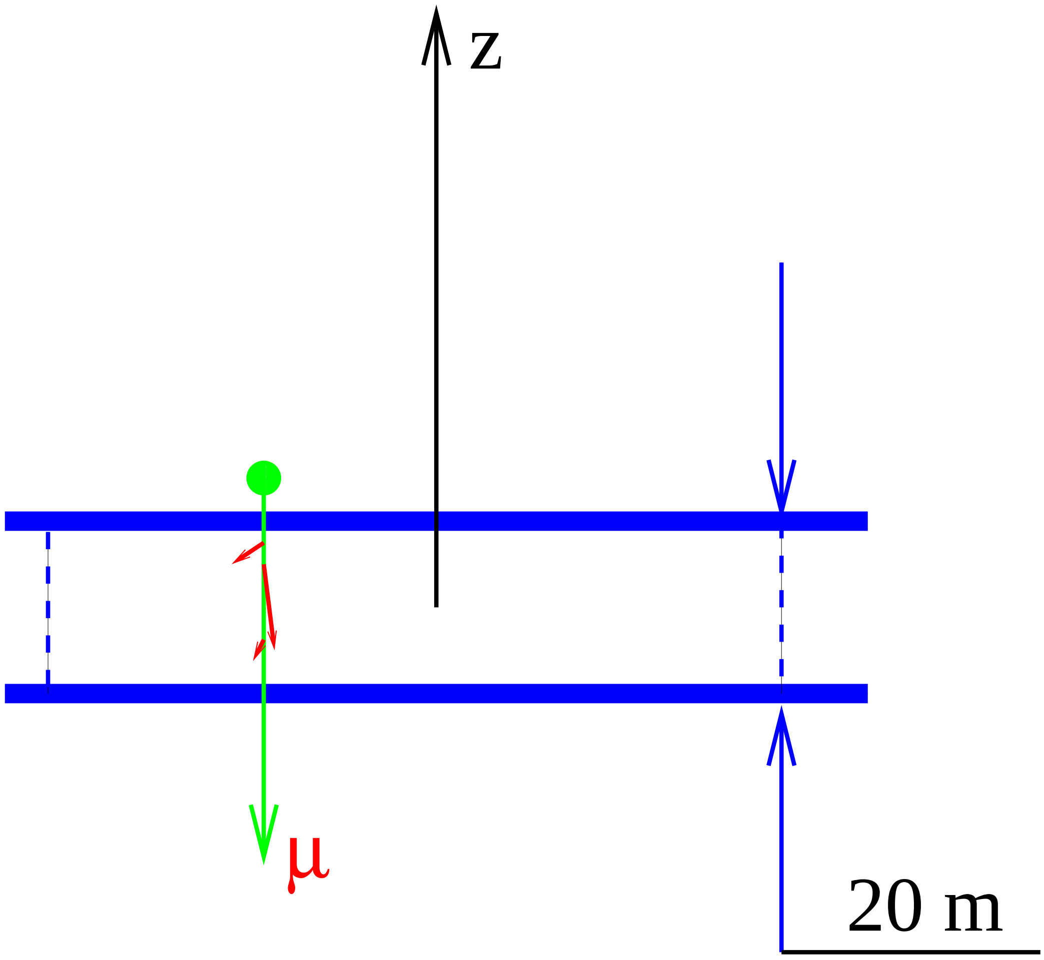
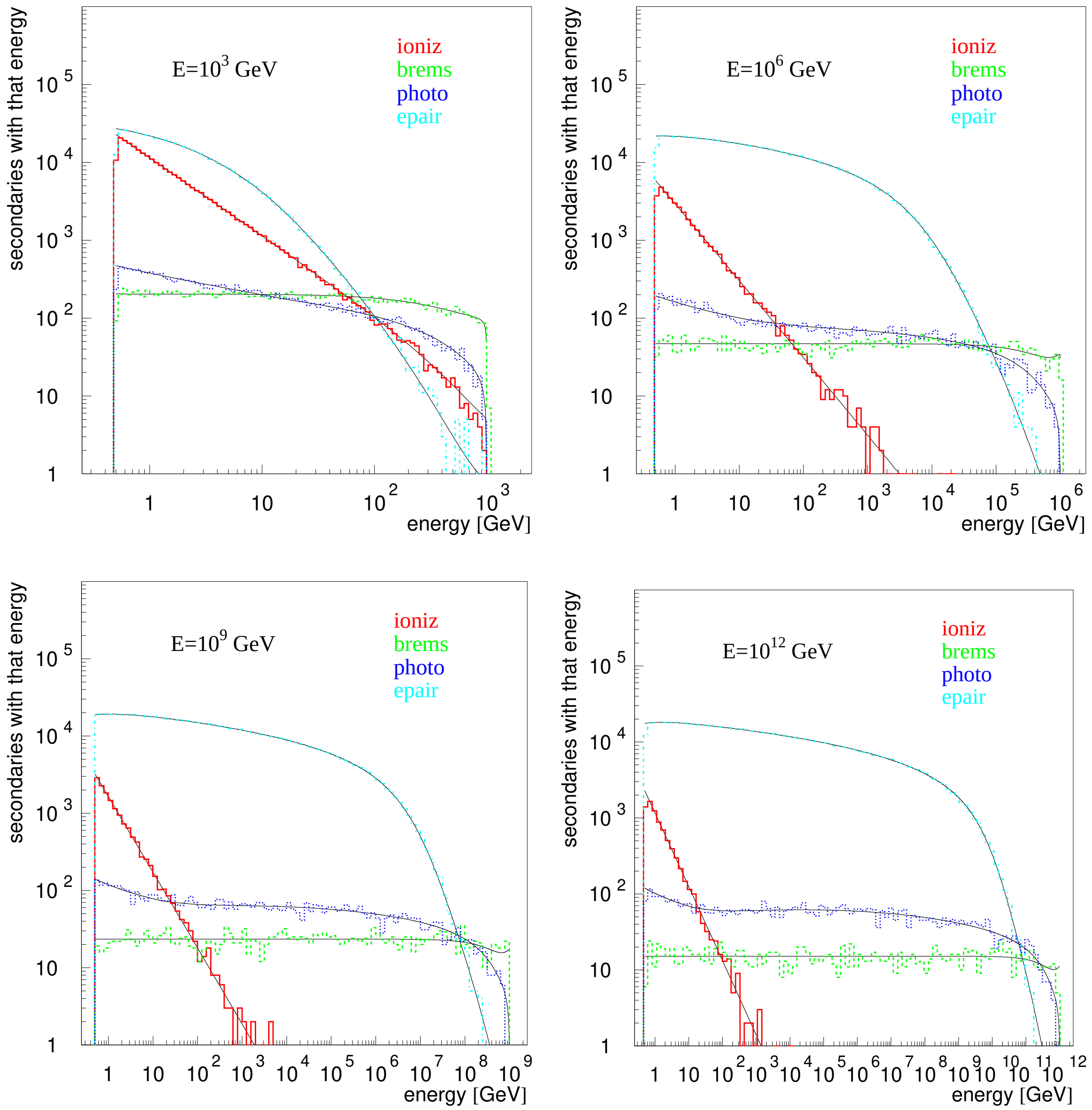
Spectra of the secondaries

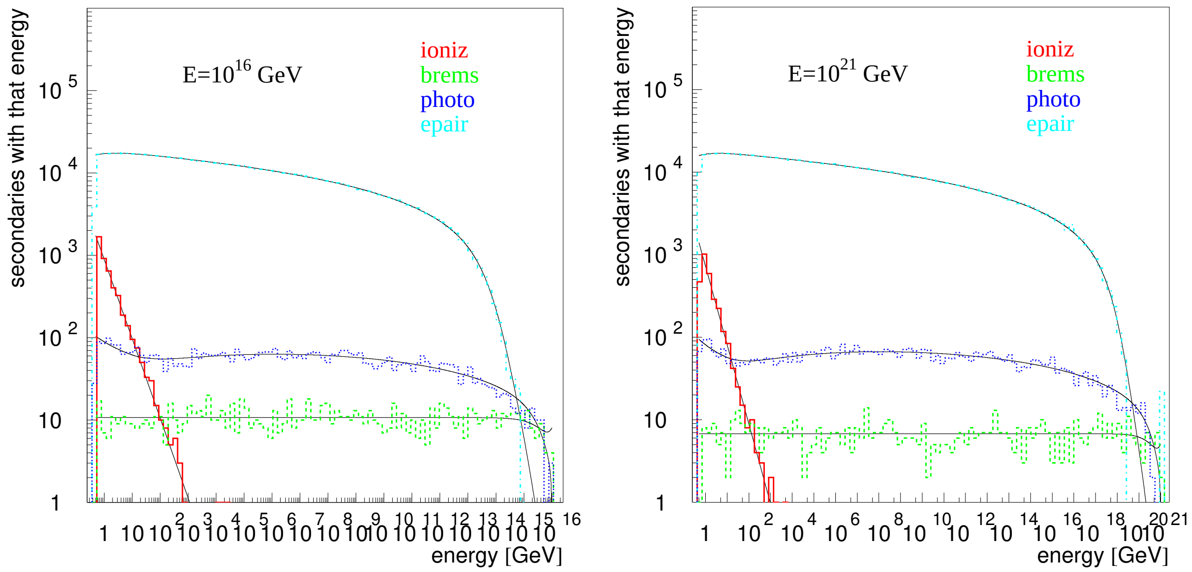


MMC: spectra of the secondaries



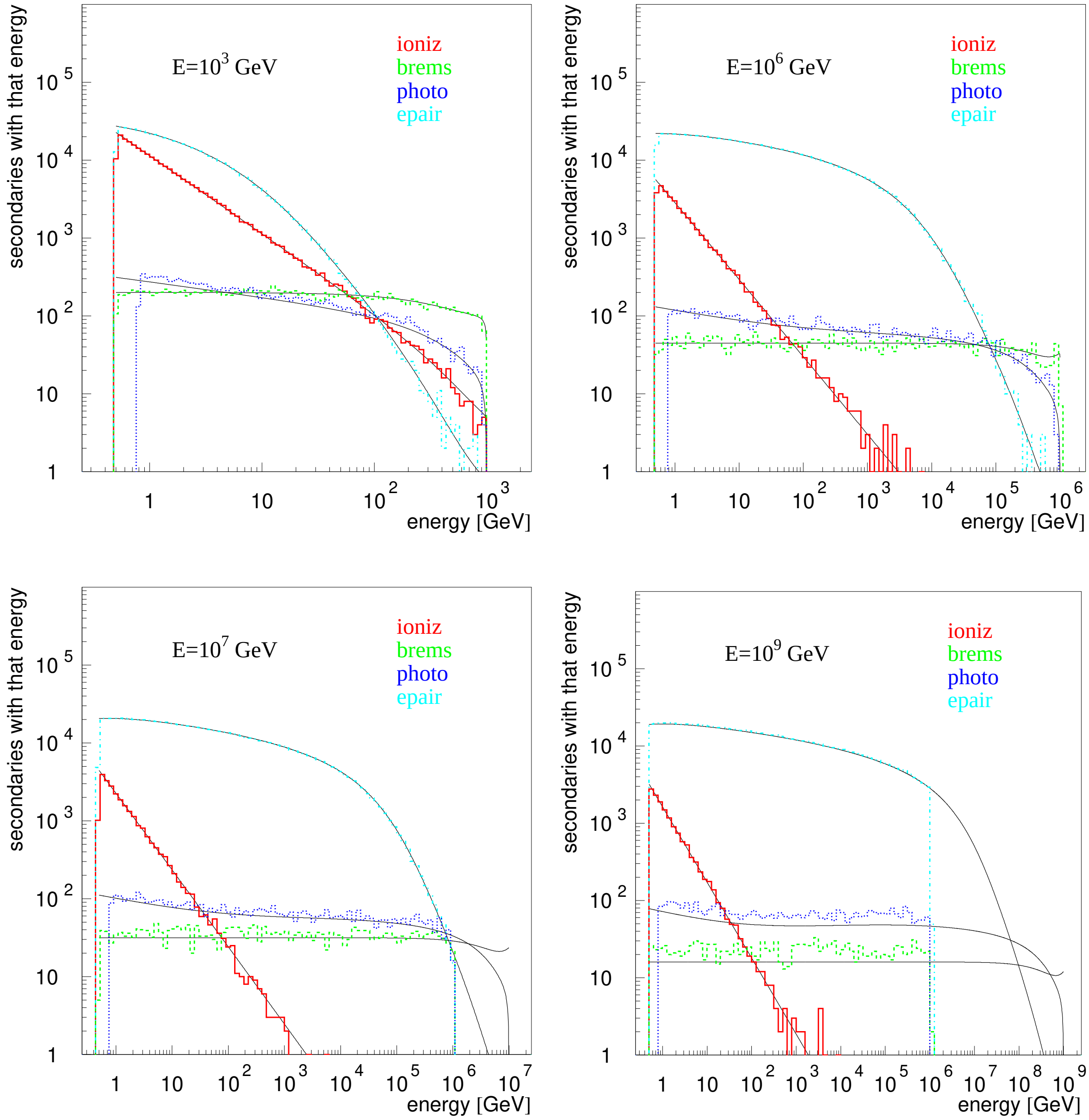
Solid curves are probability functions normalized to the total number of secondaries above 500 MeV

MMC: spectra of the secondaries



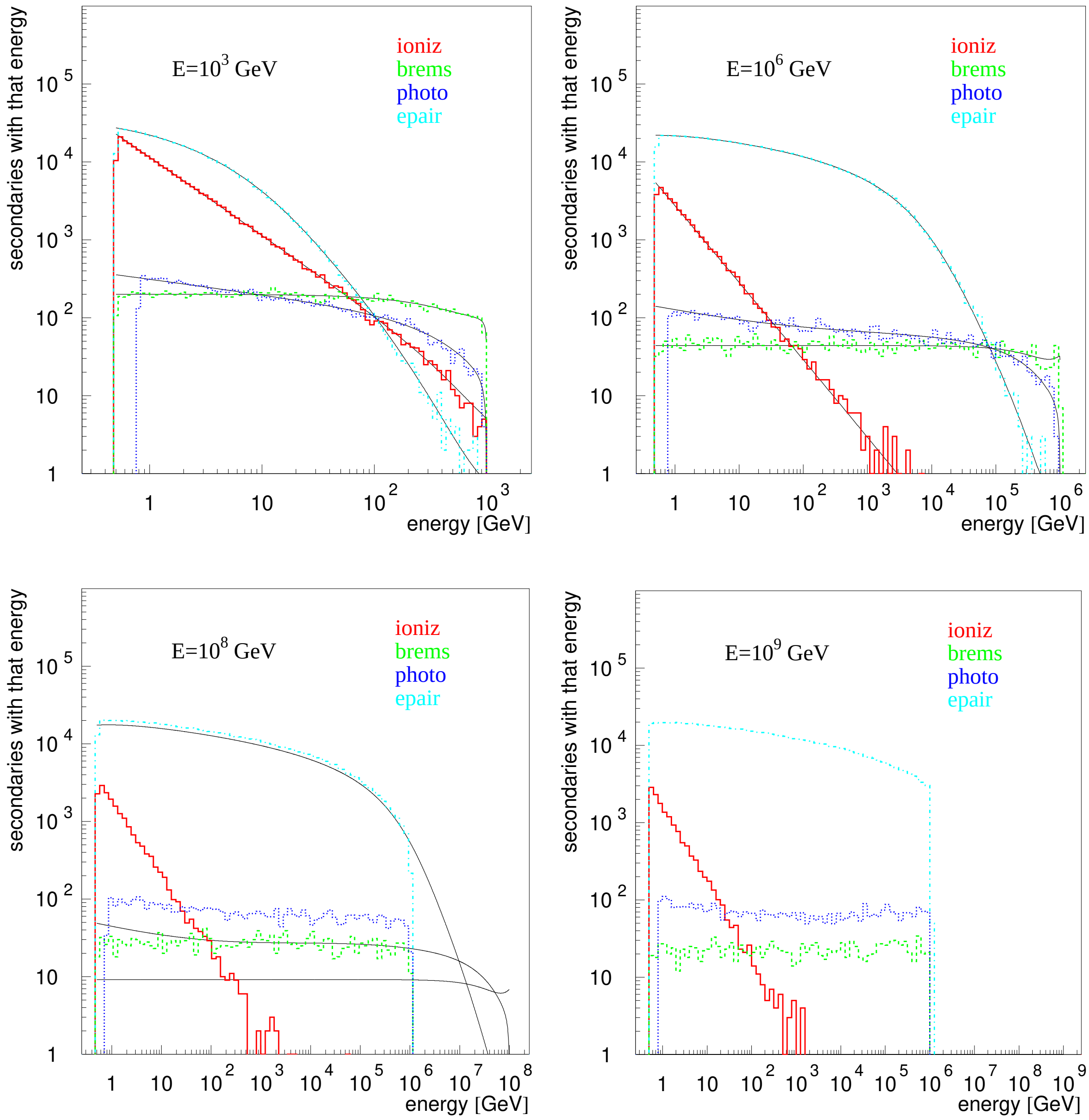
Solid curves are probability functions normalized to the total number of secondaries above 500 MeV. A setting of ebig=10^{21} GeV is used (also in the last plot of the previous slide; default is 10^{11} GeV).

MUM: spectra of the secondaries



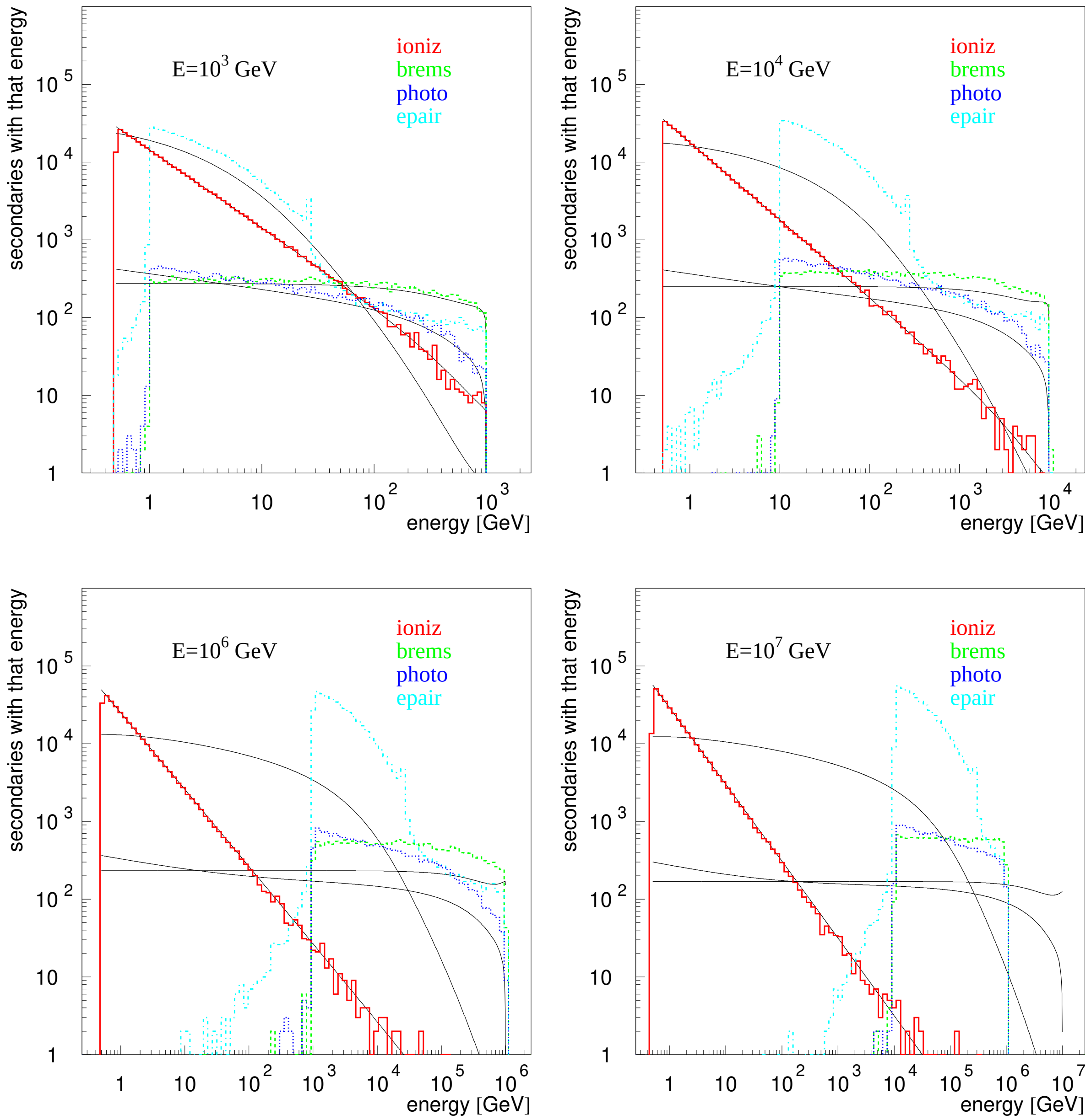
Solid curves are probability functions normalized to the total number of secondaries above 500 MeV

MUM: spectra of the secondaries



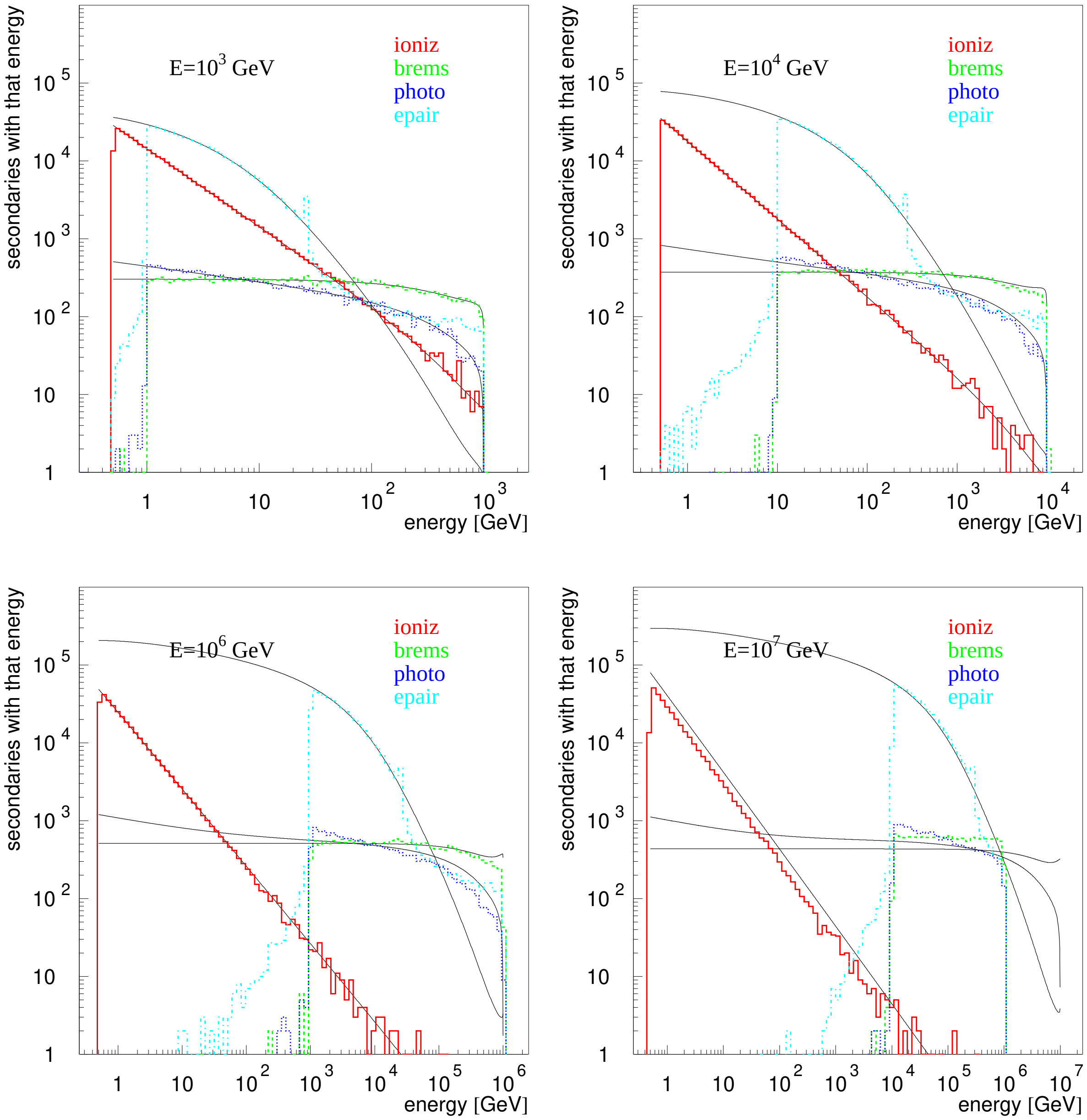
Solid curves are probability functions normalized to the total number of secondaries above $10^{-3} \cdot E_\mu$

LOH: spectra of the secondaries



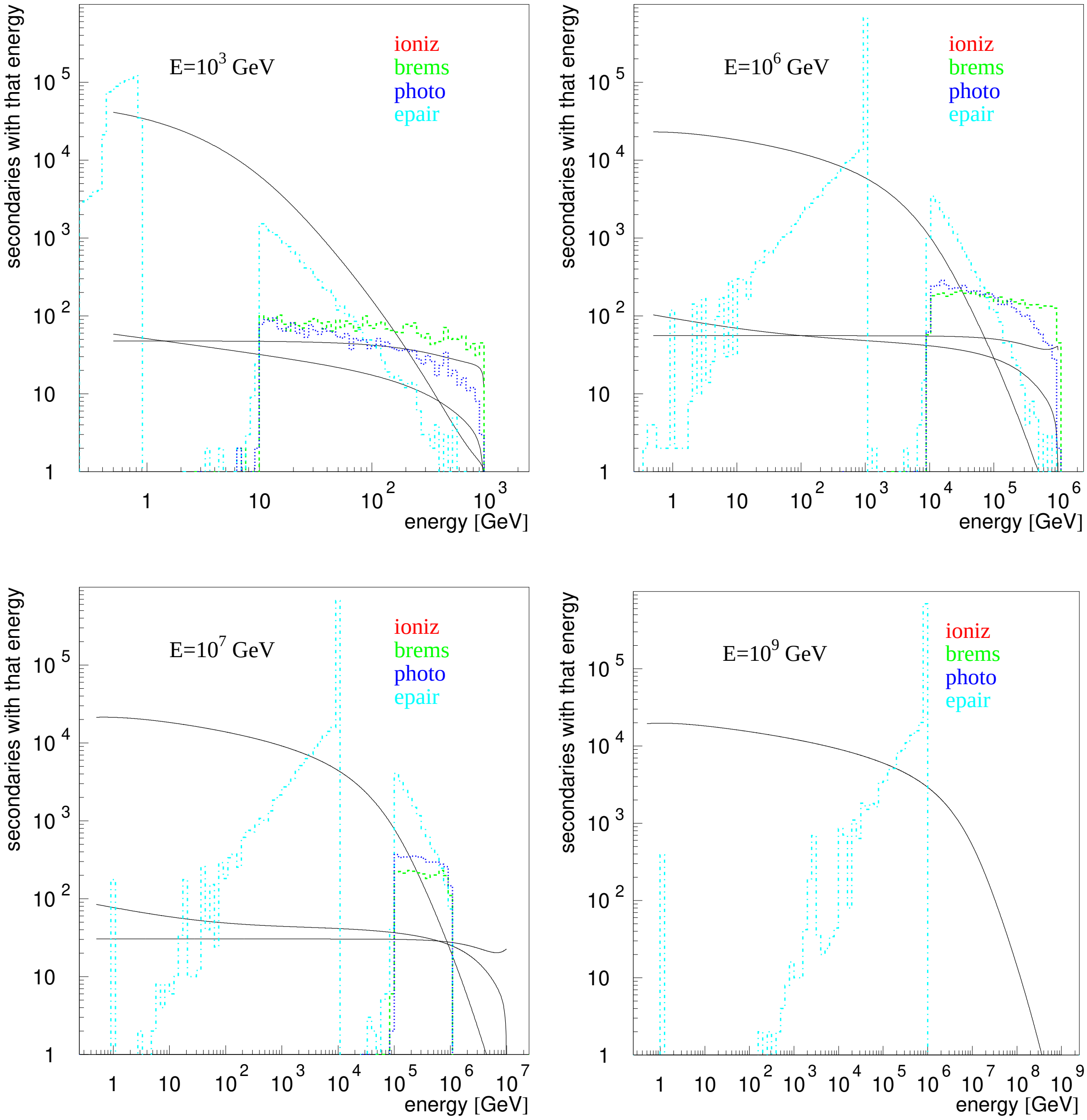
Solid curves are probability functions normalized to the total number of secondaries above 500 MeV

LOH: spectra of the secondaries



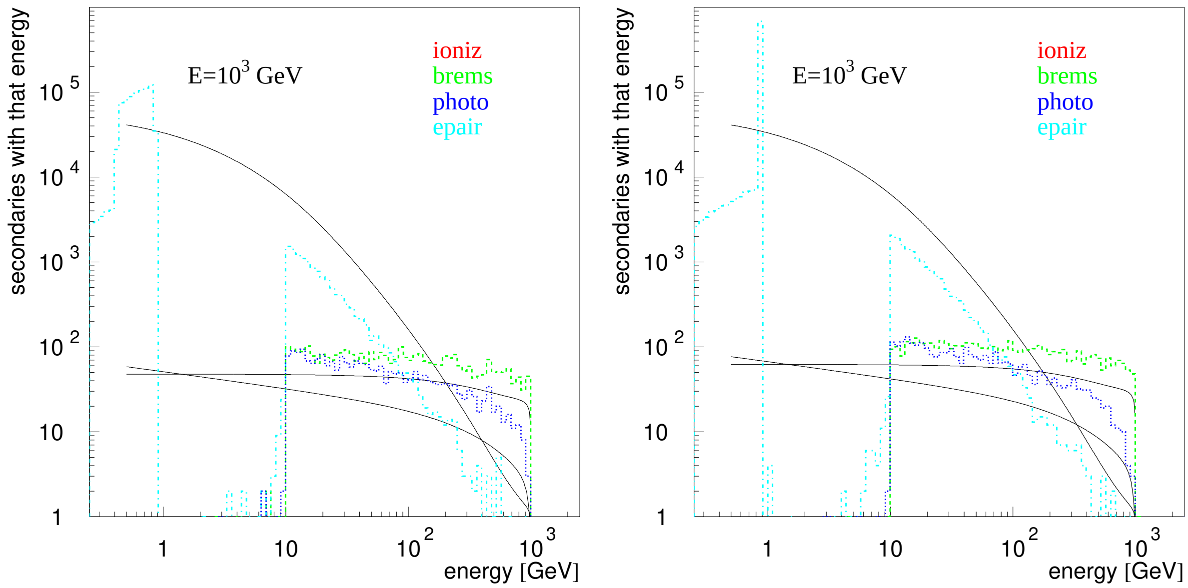
Solid curves are probability functions normalized to the total number of secondaries above $10^{-3} \cdot E_\mu$

LIP: spectra of the secondaries



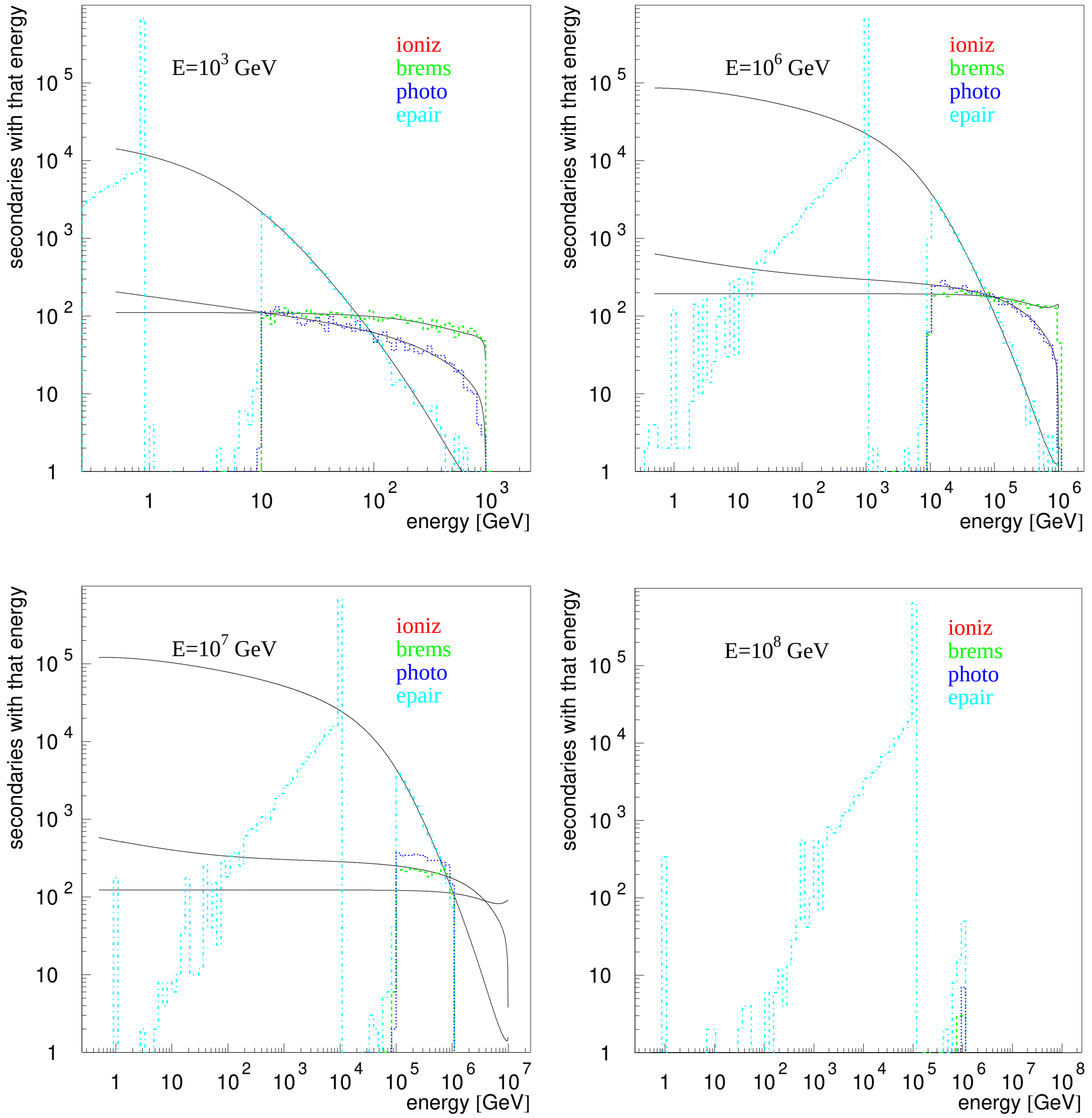
Solid curves are probability functions normalized to the total number of secondaries above 500 MeV

LIP: spectra of the secondaries



Solid curves are probability functions normalized to the total number of secondaries above 500 MeV. Muons in the plot to the right go straight down, and to the left at a 1 degree angle. The shape of the small energy part of the epair spectrum plot also depends on the location of the point where the muon tracking starts, the detector geometry, etc.

LIP: spectra of the secondaries



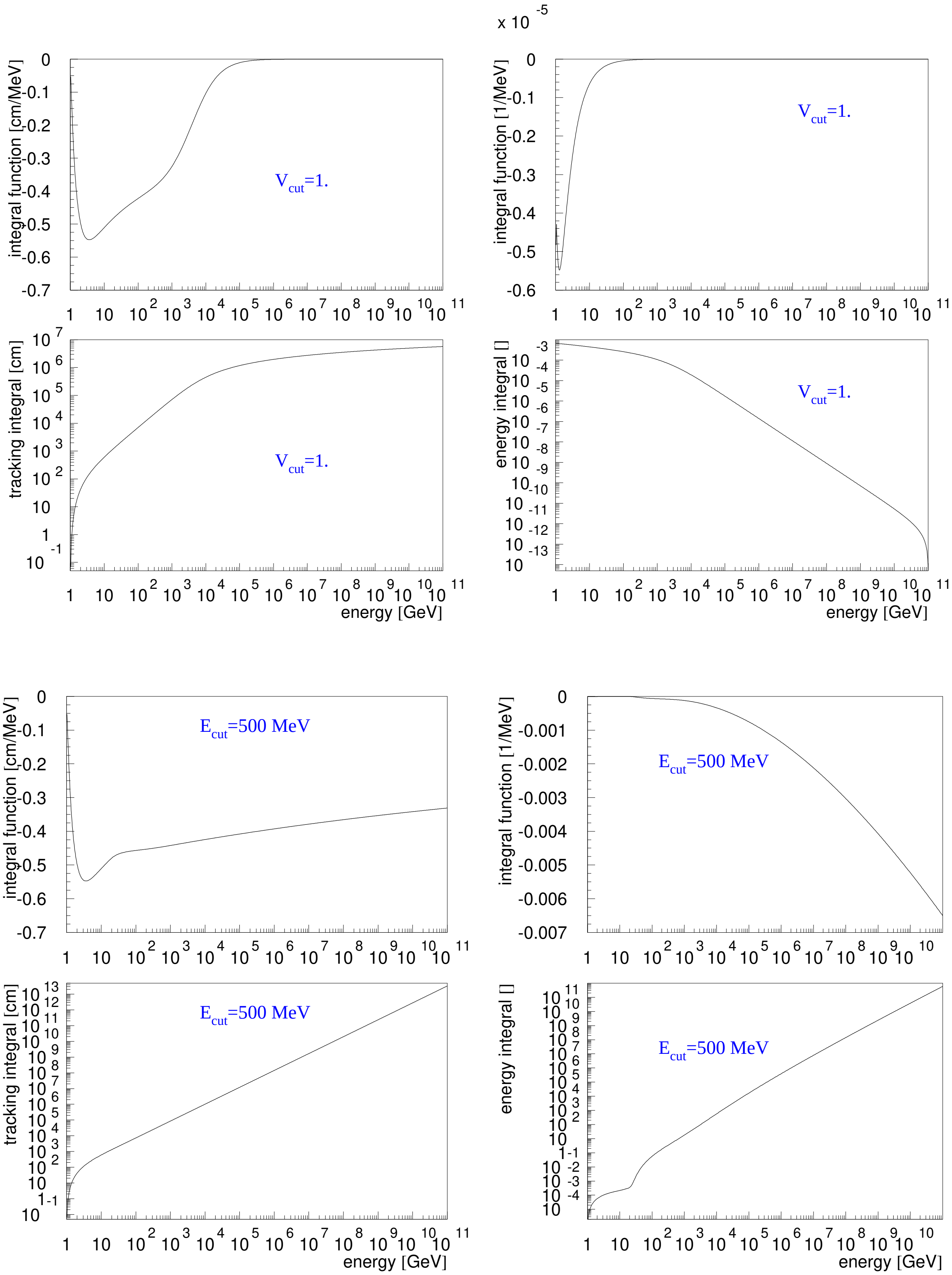
Solid curves are probability functions normalized to the total number of secondaries above $10^{-2} \cdot E_\mu$

Tracking and energy integrals

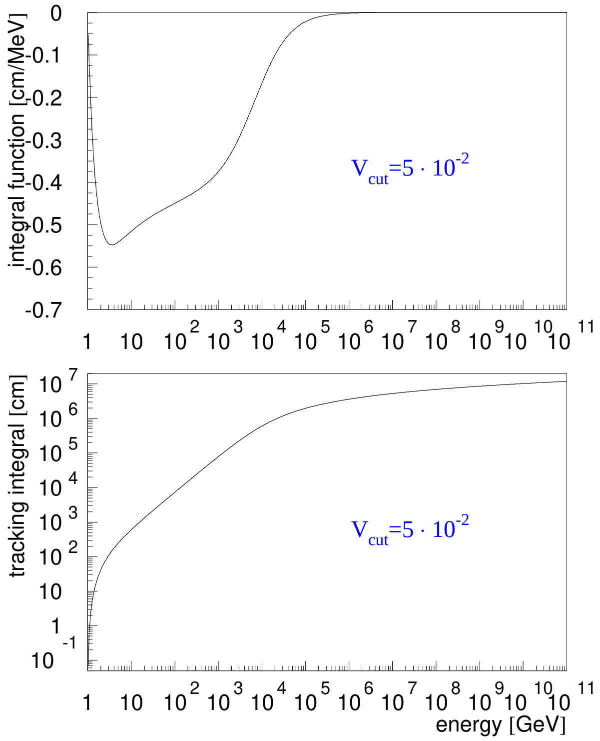
$$\int_{E_i}^{E_f} \frac{\sigma(E)}{-f(E)} \cdot dE = -\log(\xi) \quad \text{(energy integral).}$$

$$x_f = x_i - \int_{E_i}^{E_f} \frac{dE}{f(E)} \quad \text{(tracking integral).}$$

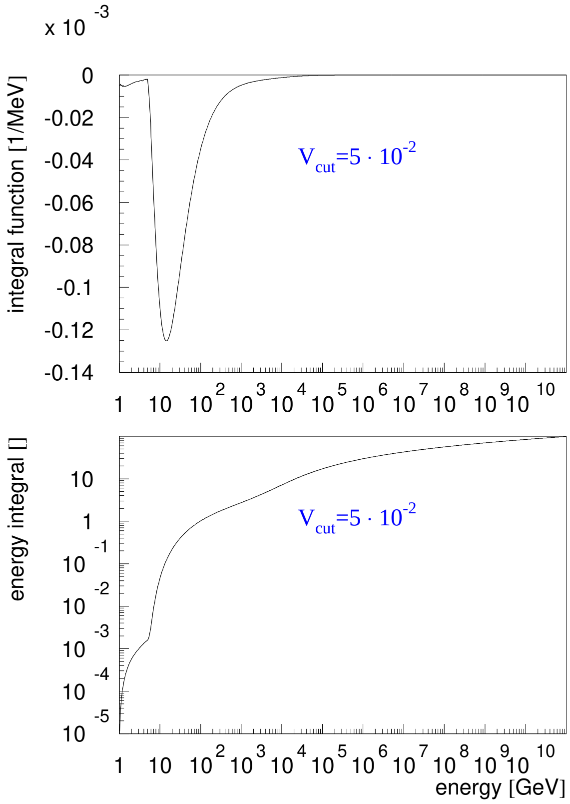
Tracking Integral **Energy Integral**



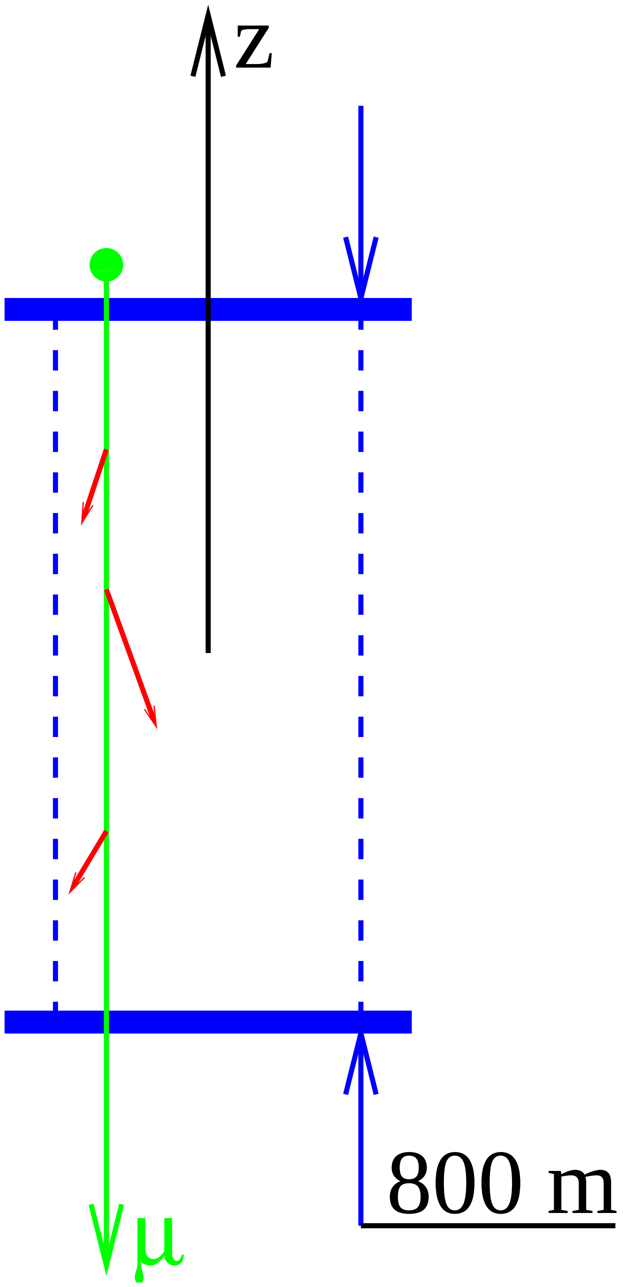
Tracking Integral



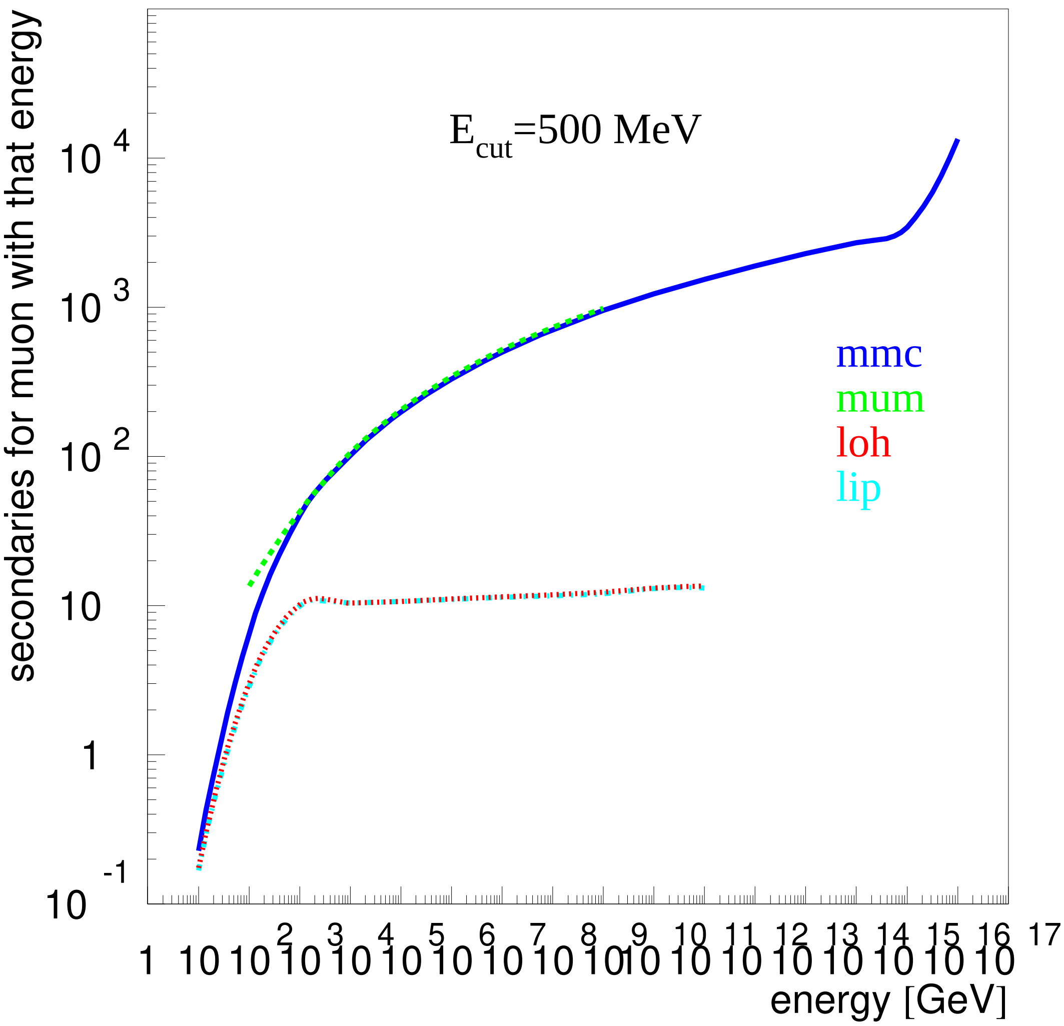
Energy Integral



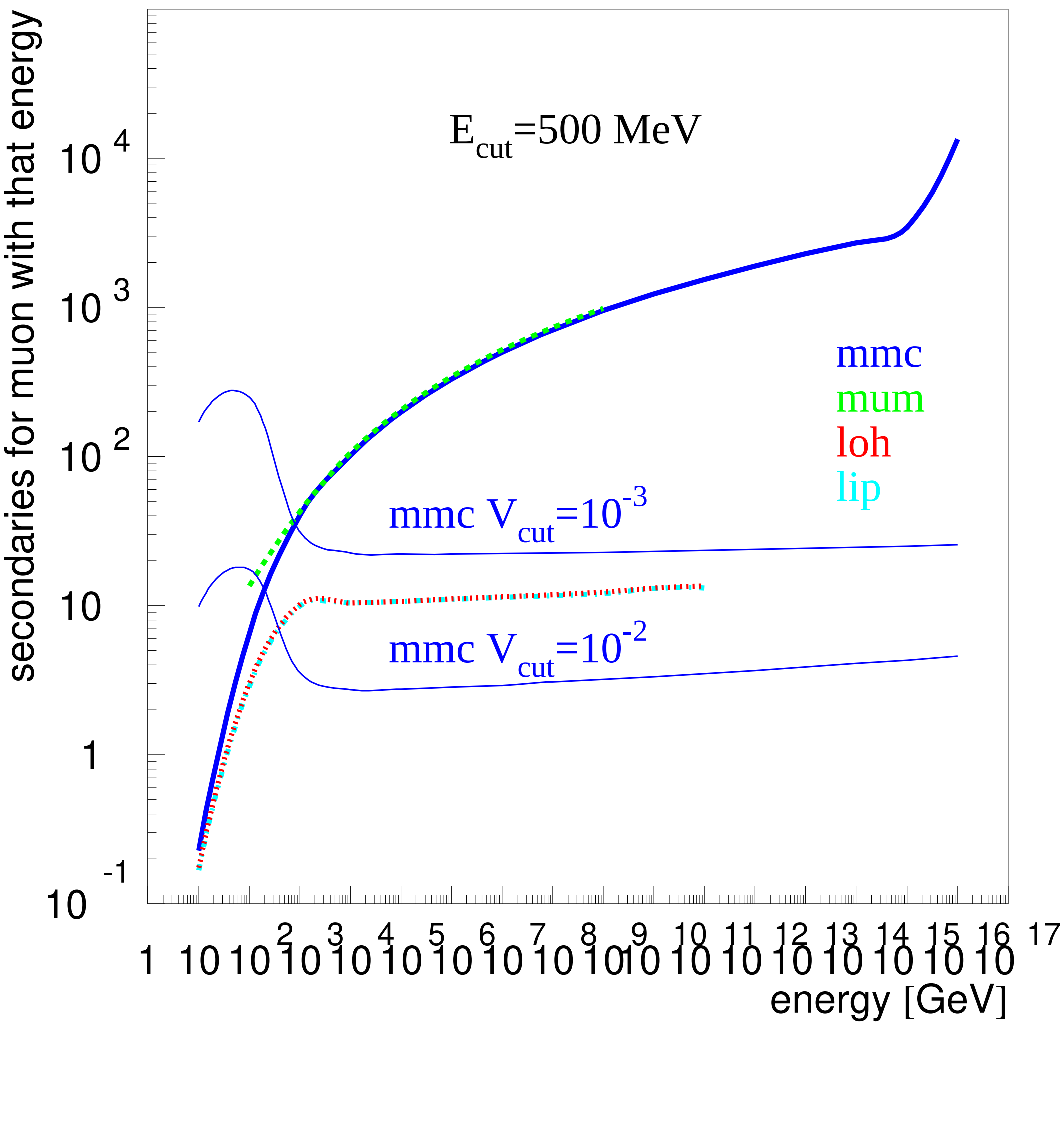
Number and total energy of secondaries



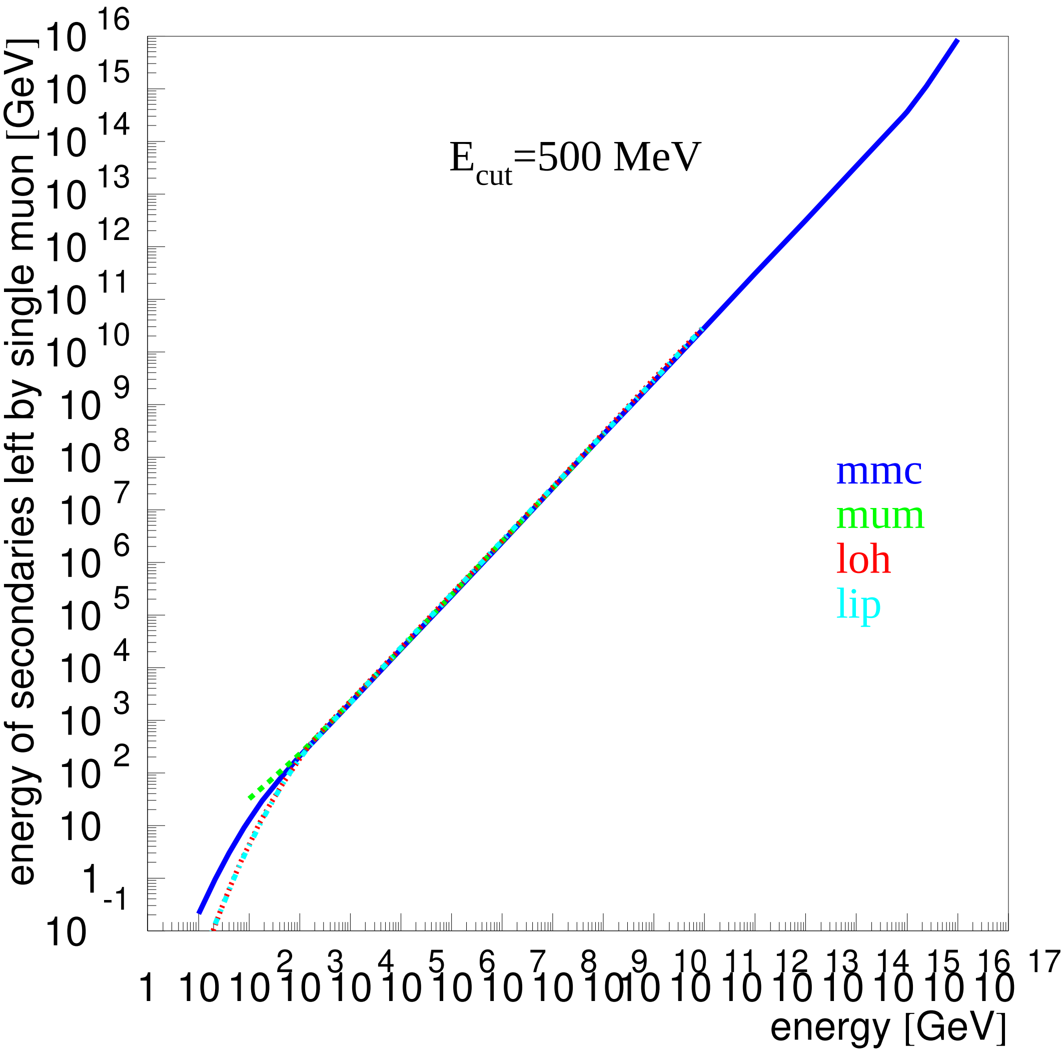
Number of secondaries



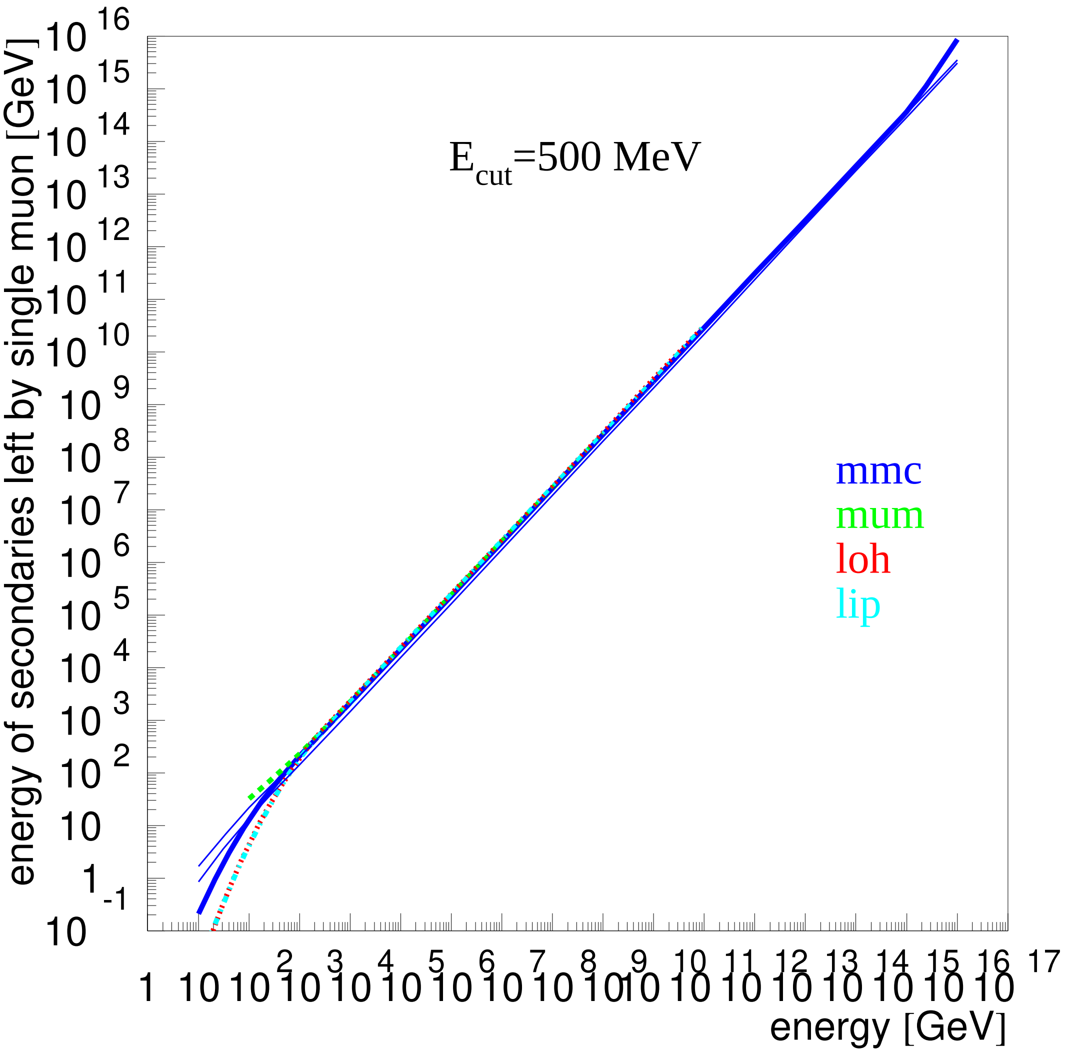
Number of secondaries



Total energy of secondaries



Total energy of secondaries



Total energy of secondaries