

Homework n.5 (optional)

Using the Monte Carlo method generate a random variable with pdf $f(E)$ below (to be properly normalized) smeared with a gaussian resolution $g(E)$. Plot the corresponding histogram. (Suggestion: plot the histogram with and without the gaussian smearing).

$$f(E) = f_1(E) + f_2(E) + f_3(E)$$

$$f_1(E) = 1/E \quad \text{for } 0.1 < E < 0.9 \text{ MeV}$$

$$f_1(E) = 0 \quad \text{for } E < 0.1 \text{ or } E > 0.9 \text{ MeV}$$

$$f_2(E) = G(\mu = 1 \text{ MeV}, \sigma = 0.01 \text{ MeV})$$

$$f_3(E) = G(\mu = 1.3 \text{ MeV}, \sigma = 0.01 \text{ MeV})$$

$$g(E) = G(E, \sigma) \quad \text{with } \sigma/E = 5\%/\sqrt{E(\text{MeV})}$$