

Proton basic data for exercise 5:

- For Matlab users, the data are in the `tabulatedParticleDoseDataProtons.mat` file, uploaded to the lecture webpage. The file contains 211 energies (50MeV-260MeV in 1MeV steps) in the matrix `energiesV` and 5501 depths (0-55cm in 0.01cm steps) in the matrix `depthV`. For each of those energies and at each depth, the central axis term dose in Gy is given in `depthDoseCurveM` (each column corresponds to an energy and each line to a depth) and the standard deviation of the Gaussian off axis term in `lateralSpreadSqrM` (each column corresponds to an energy and each line to a depth).

- For non Matlab users, the data are summarized into two txt files, uploaded to the lecture webpage. The file `CentralTerm.txt` contains a first line with all the energy values (MeV) and a first column with all the depth values (cm). The rest of the values are the central axis doses in Gy, at each different depth and for each different E. Similarly, the `OffAxisTerm.txt`, contains the standard deviation values for each energy at each depth.

- Finally, the file `EXAMPLE_CERR_BEAMSET.mac`, contains the plan to be calculated. Each beam starts from the position described in the line `"/gps/pos/centre X Y Z cm"`, with X being common for all, and Y, Z changing. The beam direction is along +X and you can assume that the whole volume is water (the base data are calculated in water!). Each beam energy is given by the line `"/gps/ene/mono E MeV"`. Please ignore the lines starting with an #. The weight of each beam is given by the line `/gps/source/add N` and the total weight is `Ntot=12897431963.97087`. So the dose of every pencil beam should be weighted as N/N_{tot} . The rest information is irrelevant to your exercise.