MUM: FLEXIBLE PRECISE MONTE CARLO CODE FOR HIGH ENERGY MUON PROPAGATION THROUGH THICK LAYERS OF MATTER

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A new muon propagation Monte Carlo code MUM (MUons+Medium) which posseses some advantages in accuracy and flexibility over analogous codes is presented. Basic concept of the algorithm and the most important features are described. Selected results obtained with MUM are given and compared with ones from other codes. Results on the test for accuracy of treatment of the muon energy losses with MUM are presented. It is evaluated to be 0.002 or better, depending upon simulation parameters. Dependence of computed muon flux at different depths in water on the simulation parameters and simplifications is discussed, contribution of different simplifications to the resulting error is analysed, ranked and compared with uncertainties which come from parametrization accuracy both for sea-level muon spectrum and muon cross-sections.