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A Geant4 Physics List for Shielding Calculations

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Geant4 is a toolkit for the simulation of the passage of particles through matter. It is widely used in many domains including high energy physics, nuclear physics, astrophysics, space science and medical physics. Members of the Geant4 hadronic working group have been involved in shielding calculations during the past four years, and have participated in the “Inter-comparison of Medium-Energy Neutron Attenuation in Iron and Concrete” project since SATIF8.

The toolkit approach of Geant4 allows the users to select amongst the physics models and cross sections those which are best suited to their application domain and use case. These elements are assembled into a “Physics List” class, the details of which may vary significantly between use cases.

We present a Physics List tailored for shielding calculations. It involves a selected set of improved physics models and cross sections. We explain this physics list and the selection of models. Comparisons with data will be shown, to illustrate the effects of various choices.

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