

Introduction

G4ParticleHP rely in ENDF-6 format databases

Information in the ENDF-6 format databases (XS+FS) is presented in a format not prepared to preserve energy and momentum event-by-event, but on average.

For many applications (simulations of detectors) it is almost necessary to preserve energy and momentum event-by-event,



Present status

By default G4ParticleHP tries to conserve energy event by event

Does it work? → sometimes yes. In general, no. In addition, in some cases the energy is no longer conserved on average.

→ One of the difficulties is that it tries to conserve the energy and at the same time it tries to reproduce the ENDF-6 energy distributions

This can be disabled (highly recommended, in my opinion) with:

- `export G4NEUTRONHP_DO_NOT_ADJUST_FINAL_STATE=1`
- `export G4PHP_DO_NOT_ADJUST_FINAL_STATE=1`



What I propose

1- Define only one environmental variable to decide what to do concerning energy conservation. This variable can take different values → `G4ParticleHP_EnergyConservationFlag`.

2- For the moment, at least two options:

`G4ParticleHP_EnergyConservationFlag = 1` → ENDF-6 like mode, i.e. no energy conservation event by event.

`G4ParticleHP_EnergyConservationFlag = 2` → Energy and momentum is “always” conserved event-by-event. No ENDF-6 info is used for the FS, but a model.

Do you agree? Other suggestions?

Question: I have some idea about how to implement the “energy and momentum” conservation model, but if you have suggestions, they are very welcome.