Review of Open Problem Reports

Geometry WG

Transportation & Navigation

- #2047
  - *The particles stop in world volume by G4UserSpecialCuts process without depositing their kinetic energy*
  - Particles by a special cuts process are stopped, when a particle kinetic energy goes beyond the energy limit (as in G4UserLimits), without depositing the remaining kinetic energy. This happens when the special cuts process is invoked in the world volume. A patch is provided reproducing the problem with the basic B4a example. K.Amako believes the problem is in the Transportation when trying to transport a particle with zero step length. Last reply: April 2018
- #2314
  - *G4RegularNavigation is broken*
  - Reporting many warning for stuck tracks from **`G4PhantomParameterisation`**. User has been posting a possible solution, which was judged not optimal? Last reply: March 2021. Ticket #2359 has been marked a duplicate, but in this case many particles are also getting killed; ticket #2359 was also reopened as #2369, which still has no reply!

Magnetic field

- #2137
  - *hstep=0 Error in G4MagInt_Driver::AccurateAdvance*
  - When generating particle gun of 1GeV muons in Belle II software framework, these errors are being produced:

```
[ERROR] In G4MagInt_Driver::AccurateAdvance(),
 GeomField1001: Proposed step is zero; hstep = 0
```

    The problem is reported to happen with release 10.1. Last reply: February 2020
- #2188
  - *Events not independent due to magnetic field + looper thresholds kill primary particle in all subsequent events*
  - User reports that in their code (BDSIM), since release 10.5 (including p01), if a particle gets stuck and an event safely aborted, the navigation can remain in a bad 'state' and every subsequent event has severe problems. This behavior can include (shockingly) killing the primary particle on the first step (?). Apparently not easily reproducible other than with release 10.5. Last reply: February 2020
- #2260
  - *Magnetic field does not take effect, trajectory keeps straight line*
  - Running the *purging_magnet* example, the trajectory of e- is not bended (release 10.6.p02). First investigation made seems to indicate a problem due to sampling of the length of integration. A problem to be fixed in the example? Last reply: January 2021

Magnetic field - 2

- #2280
  - *Inconsistent definition of magnetic field for backward error propagation*
  - Using release 10.6.p01, seems there is an inconsistency in the equation of motion used for backward error-propagation and the one invoked by the **`G4DormandPrince745`** steppe. A recipe has been provided to overcome the problem, but shouldn't this be fixed in Geant4? Last reply: May 2021