Hands-On Session 6

Code without Solution: hands-on-6.tar.gz

Code with Solution: hands-on-6-solution.tar.gz

Exercise 6

Part A

- With use of **G4AnalysisManager** (see example B4/B4d):

    1. Create and fill histogram

        - Define a 1D histogram for the energy deposited per event for each calorimeter layer

        - Implement filling of histograms in the **EDEmCalorimeterSD::EndOfEvent()** function.

        - Hint

            * To access the ith calorimeter hit from fHitsCollection:

            ```
            EDEmCalorimeterHit* hit = (EDEmCalorimeterHit*)(*fHitsCollection)[i];
            ```

            * Activate plotting of histograms using the UI command(s)

    2. Create and fill ntuple

        - Define two ntuples representing the tracker chamber hit in each tracker chamber

        (a) the chamber layer number

        (b) hit local position (x, y, z)

        - Implement filling of ntuple in **EDChamberSD::ProcessHits();**

    3. Inspect generated file in Root with Root browser

        - The command to call Root in our environment:

            /usr/bin/root[1]

Part B

- Inspect the implementation of a command using **G4GenericMessenger** in the **EDEventAction** class, execute the command to inactivate verbose mode and run a new event

- Make randomizing of the particle direction optional, and then implement a command to select the randomize option using **G4GenericMessenger** in an analogous way as the command in **EDEventAction**

    - Add a new data member **fRandomize** of a **G4bool** type

    - Add a **G4GenericMessenger** object in **EDPrimaryGeneratorAction** and call its **DeclareProperty** method to create **setRandomize** command

---

[1]ssh with **-X -C** options (X11 Forwarding and compression)