Simulation in Batch Mode

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What is Batch Mode

- Simulate multiple events according to input macro file to generate the root output
- Input macro file provide what physics models, event types to generate, geometry, magnetic field, output destination, and no.of events to simulate

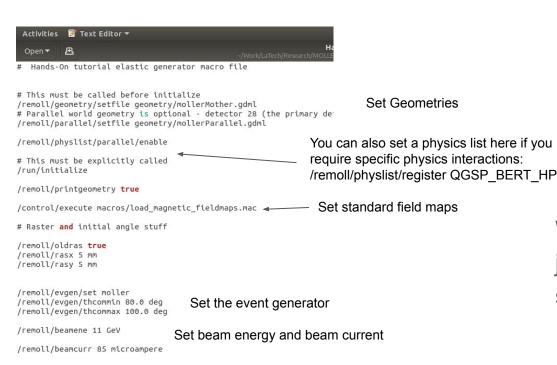
Input Macro File

- Standard input files are available in macros directory remoll/macros
- Hands-On-Remoll directory has three such files that we will use

```
HandsOn_run_moller.mac, HandsOn_run_ep.mac
HandsOn_kryptonite.mac
```

Copy these files to you VM or to ifarm remoll/macros

Input Macro File



```
Kryptonite materials are set here
# Make interactions with W, Cu, and Pb
# realistic rather than pure absorbers
#/control/execute macros/HandsOn kryptonite.mac
##disable all detectors,
/remoll/SD/disable all
                         Control what sens, detectors to enable
/remoll/SD/enable 28
/remoll/SD/enable 47
/remoll/SD/print all
/process/list
# Specify random number seed
                              Random seed control (optional)
#/remoll/seed 123456
/remoll/filename remollout_Moller_gen_2k.root
/remoll/target/print
/run/beamOn 2000
```

We will use the input macro files just downloaded to do simple study

How to Run Simulation in Batch Mode?

- 1. Goto remoll directory
- 2. ./build/remoll destination+macro file name
- This will start the simulation in batch mode
- 4. We will do following simulations first:
 - a. Run 2000 moller electrons events
 - b. Run 2000 ep elastic electron events
- 5. You can run these simulations and each one takes about 10 min
- 6. The output root files from these two jobs are also available at Hands-On Materials/Rootfiles

```
remollout_Moller_gen_2k.root and remollout_Ep_gen_2k.root
```

Enable/Disable Sensitive Detectors from Input files

- Simulation output file size can reduced if you know what sensitive detectors you want to record data
- We can first disable all the detector
- disable all detectors,

```
/remoll/SD/disable all
```

Then enable ones you want

```
/remoll/SD/enable 28
/remoll/SD/enable 47
```

Enable/Disable Sensitive Detectors from Input files

You can control what data you want to record for each detector

```
/remoll/SD/detect lowenergyneutral 28
/remoll/SD/detect secondaries 28
/remoll/SD/detect boundaryhits 28
```

Enable/Disable Kryptonite

1. Enable kryptonite feature

```
/remoll/kryptonite/enable
```

2. Then you can either turn certain materials into kryptonite

```
/remoll/kryptonite/add VacuumKryptonite
/remoll/kryptonite/add Tungsten
/remoll/kryptonite/add Copper
/remoll/kryptonite/add Lead
/remoll/kryptonite/add CW95
```

3. You can also turn certain volumes into kryptonite by giving the name of the GDML solid shape

```
/remoll/kryptonite/volume Coll1 solid1
```

Enable/Disable Kryptonite

- We are doing this using a separate macro file
- This files has the Kryptonite related settings.

```
# Enable kryptonite
/remoll/kryptonite/enable

# Set some default materials
/remoll/kryptonite/add VacuumKryptonite
/remoll/kryptonite/add Tungsten
/remoll/kryptonite/add Copper
/remoll/kryptonite/add Lead
/remoll/kryptonite/add CW95

# Set selected volumes kryptonite
##/remoll/kryptonite/volume Coll1_solid1

# List materials
/remoll/kryptonite/list
```

```
# Make interactions with W, Cu, and Pb
# realistic rather than pure absorbers

→#/control/execute macros/HandsOn_kryptonite.mac

##disable all detectors,
/remoll/SD/disable_all
/remoll/SD/enable 28
/remoll/SD/enable 47
/remoll/SD/print_all
/process/list

# Specify random number seed
#/remoll/seed 123456

/remoll/filename remollout_Moller_gen_2k.root
/remoll/target/print
/run/beamOn 2000
```

Remarks

Now we will utilize the simulation in batch mode and Hands-On root analysis script to do a very simple simulation analysis project