

Extending command-based scorer

- Current command-based scorer works as following.
 1. Construct a parallel world with mesh geometry and register a dedicated G4ParallelWorldProcess to ProcessManager of all particle types
 2. Instantiate thread-local G4MultiFunctionalDetector and register requested PrimitiveScore(s)
 3. Set thread-local G4MultiFunctionalDetector to logical volume of the mesh cell
 4. HitMap of each PrimitiveScore is summed up after each event, and merged after the event loop
- Idea is to provide the same command-based scoring mechanism for volumes defined in mass world.
 - Steps 2. and 4. can be reused. The only addition is letting thread-local G4MultiFunctionalDetector to a logical volume in the mass world
- Also, we can utilize the G4Analysis package to create histograms, plots, n-tuples on the fly without writing any single line of C++ code.

- Construct geometry via reading GDML or ordinary detector construction, etc.
- Command samples

```
/score/create/realWorldLogVol <logVolName>
```

```
/score/quantity/energyDeposit <primitiveScorerName> <unit>
```

```
/score/close
```

```
/score/analysis/1D/create <logVolName> <primitiveScorerName> <copyNo>
```

```
/score/analysis/1D/set <nBin> <low> <high> <unit>
```

```
/score/analysis/plot
```

```
/run/beamOn 1000
```

Note: command names are still tentative



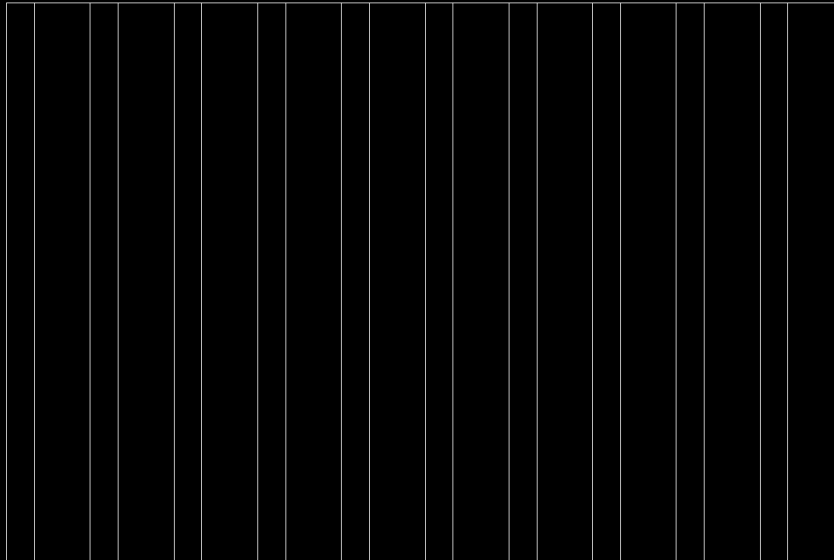
Scene tree, Help, History
Scene tree Help History

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Command

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Basic/B4a geometry



```
/score/create/realWorldLogVol Gap  
/score/quantity/energyDeposit eDepRW MeV  
/score/close  
/score/analysis/1D/create Gap eDepRW  
/score/analysis/1D/set 100 0. 50. MeV  
/score/analysis/plot  
/run/beamOn 1000
```

Output

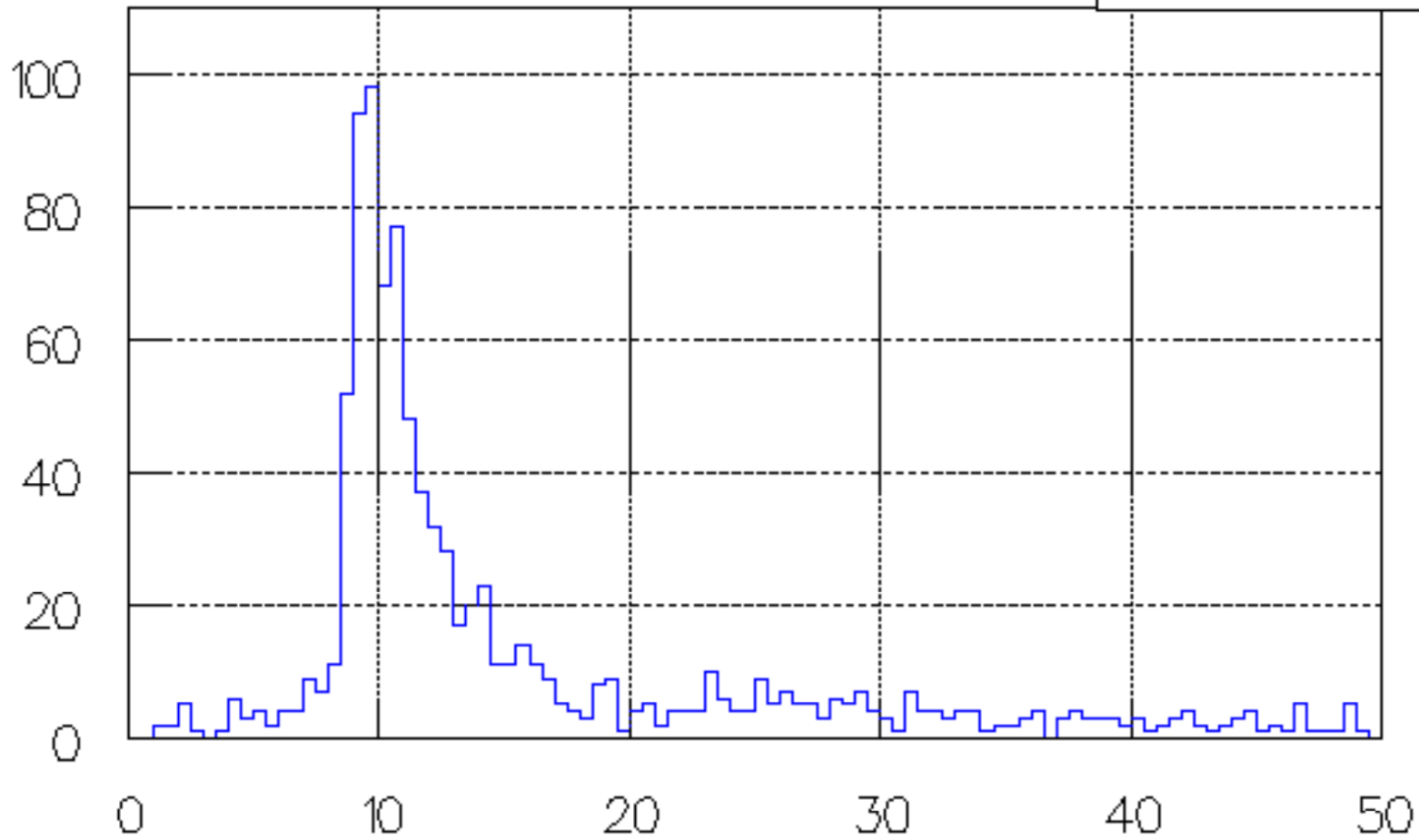


e 10".

Session :

eDepRW

Entries	1000
Mean	15.5664
RMS	9.80768



- Version 10.6 will include some limited functionalities
 - /score/create/realWorldLogVol and related commands to define scorers to mass-world volume
- Year-2020 release will have full functionalities including histogram/plot/n-tuple
 - histogram/plot/n-tuple will also be available for parallel-world scoring mesh defined through current command-based scorer