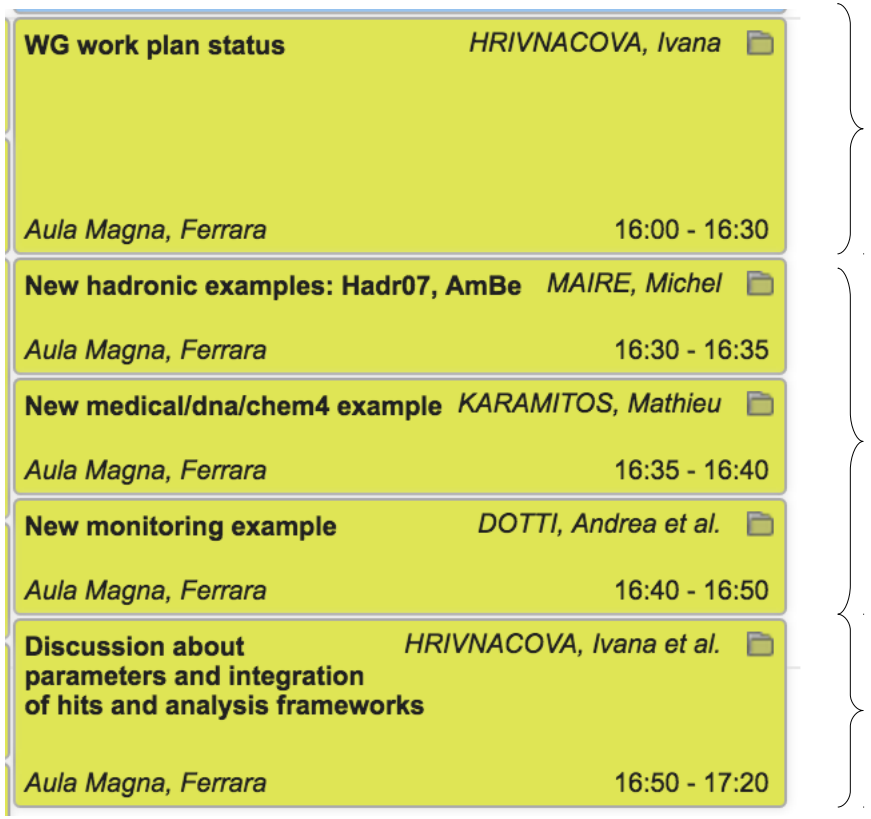
Parallel Session 4B
Basic & Extended Examples

I. Hrivnacova, IPN Orsay (CNRS/IN2P3)
P. Gumplinger, TRIUMF

21th Geant4 Collaboration Meeting,
16 September 2016, Ferrara

Agenda



Work Plan

New Examples

Analysis & Example & Kernel

Work Plan 2016

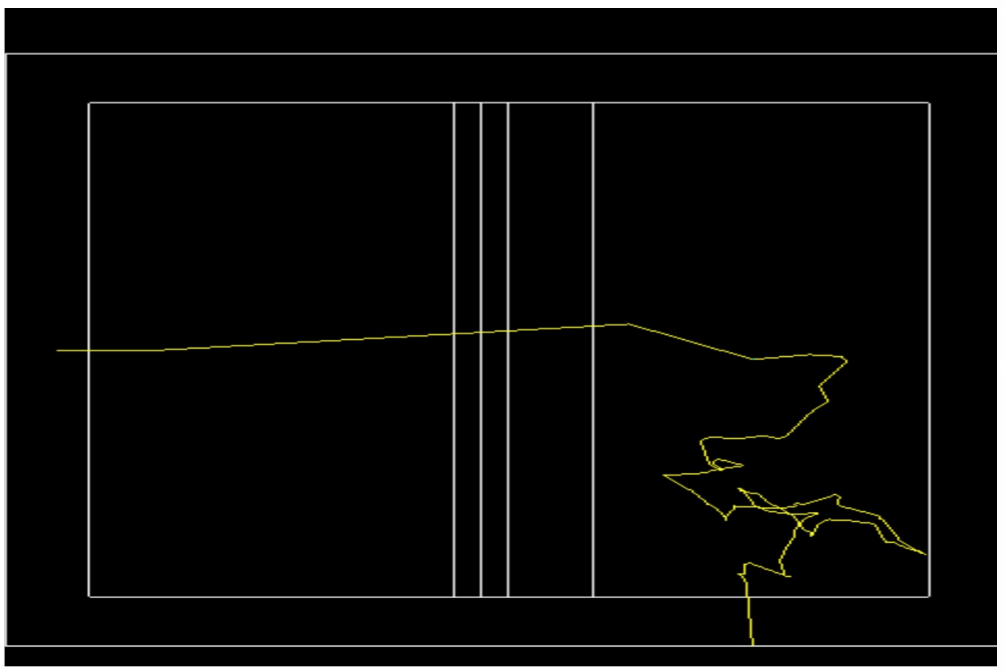
- New in this year
  - Start reviewing macros
- Ongoing improving examples
  - Eliminating obsolete features
  - Coding guidelines
    - A remineder will be send to developers of the examples which are concerned
  - MT migration
    - ~ 14 examples candidates for migration
    - No push from users for migration remaining examples, let's developers decide whether and when they will do it

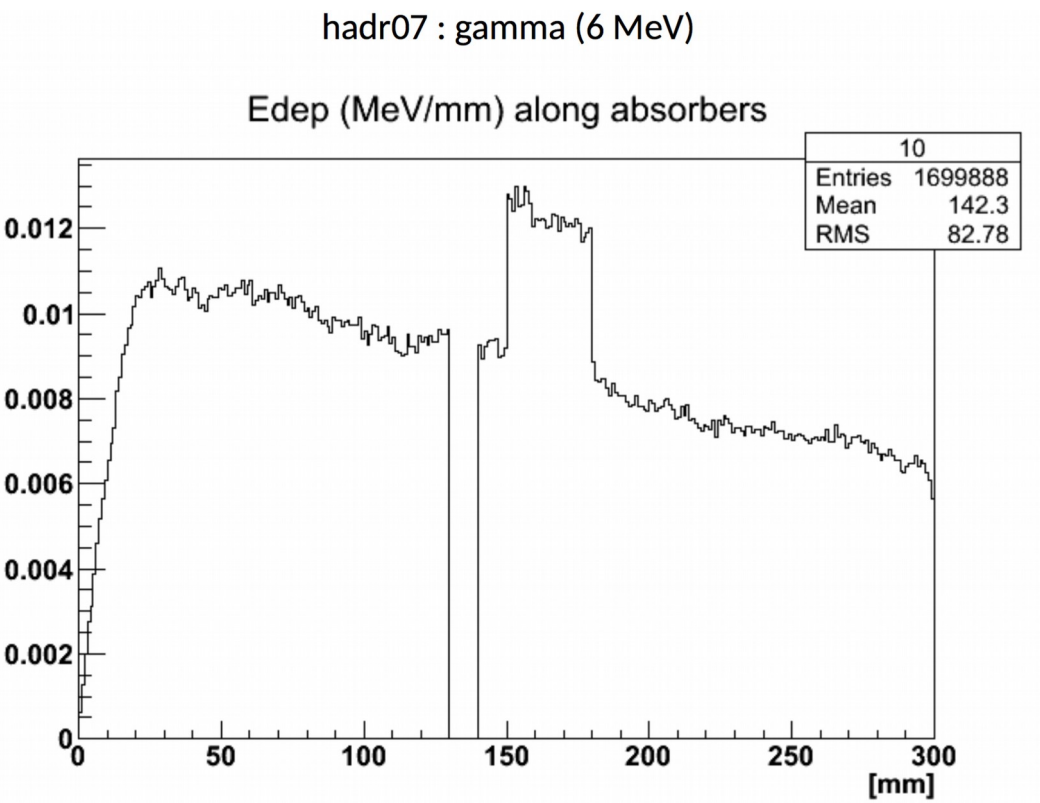
Discussion Items

- Reminder to Physics List WG the item in the Work plan to create a new directory showing how to create or use a Physics List
- Add C++11 features in basic examples
  - Update B4 (all a,b,c,d variants) and B5 for 10.3 - by Ivana and review the modifications by Andrea before proposing a tag
- FindROOT.cmake
  - Use by examples and test; a concern about a possible clash when using ROOT build via Cmake was discussed
  - Decision was taken to keep the file in place to be consistent with all other find files
    - An extra path to Cmake modules has to be set to reach the modules

Hadr07

- By Michel Maire
- Survey energy deposition and particle's flux from a hadronic cascade.

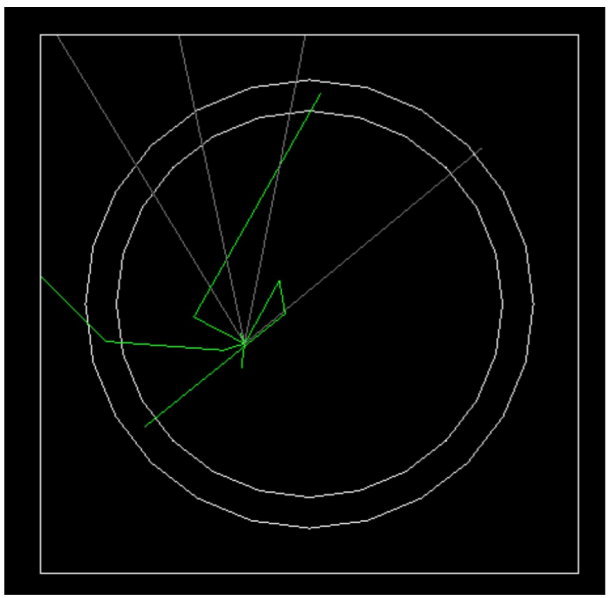


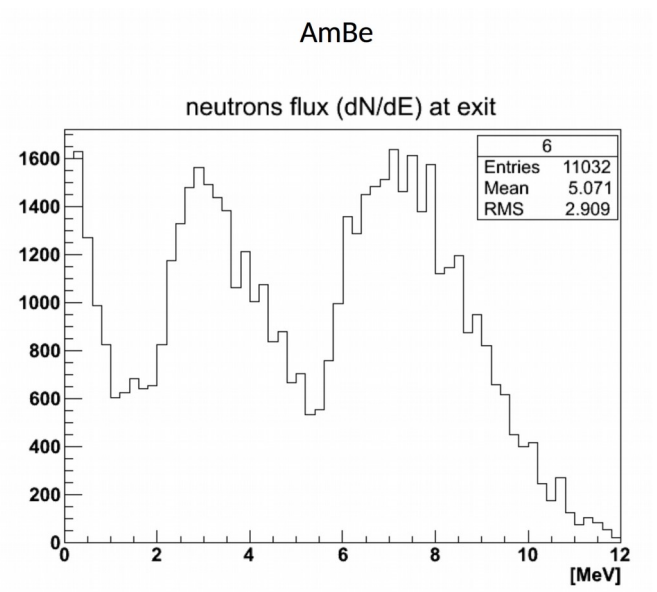


AmBe

By Michel Maire: example of neutrons source. It illustrates the cooperative work of nuclear reactions and radioactive decay processes.

- *Change of the name proposed in order to avoid confusion about Geant4 capabilities to simulate Am.*
- *Message to Hadronic WG: Make sure that particle_hp is properly documented and defined (for environment variables) prior to releasing this*
- *Message to PhysicsList WG: make sure the physics list follows the factory approach as proposed by the WG.*





Chem4

By P. Piersimoni, S. Okada, M. Karamitros

The example shows how to activate chemistry code and score the radiochemical yield G.

Radiochemical yields

- Radiochemical yields or G-values
  Number of species over time for 100 eV of deposited energy

$$G(t) = \frac{N_{mol}(t) \cdot 100\ eV}{E_{dep}}$$

- For a given species, irradiation condition, can be compared to experimental values

- Goal of chem4: record the G-values over time for each species

Monitoring

By Andrea Dotti

Demonstrating monitoring of steps/tracks, etc (in collaboration with Q&A WG)

- *The code, as it is now, introduces dependence of Run (and other) category on G4Analysis*
- *More brainstorming needed to avoid this*

The LoggingMonitoring Example

SLAC

A set of "monitors" has been created to allow one or mor
- Number of steps
- Number of tracks and time needed to complete
- Number of events and time needed to complete simulation
- Number of runs and time needed to complete simulation

Filters can be associated to each "monitor":
- Filter on particle type
- Filter on energy window
- Filter on geometry volume

Allows for logging to:
- Standard Output
- Histograms (via G4Analysis)
- Ntuples (via G4Analysis)

```
/run/initialize
# Count number of steps of e-
# with 10MeV<E<100MeV in volume "Calo"
/monitoring/step/create myMon1
/monitoring/step/addParticleFilter e- myMon1
/monitoring/step/addEnergyFilter 10 100 myMon1 //in MeV
/monitoring/step/addLogicalVolumeFilter Calo myMon1

# Save info in histograms (binning is automatic):
/monitoring/setOutput Histo file.root


/monitoring/initialize
/run/beamOn 100
/monitoring/finalize
```

Discussion about ~~parameters and~~ closer integration of analysis in Geant4

Summary of the discussion

- Developments since the last year which did not end in SVN
  - G4ScoringAnalysis class – implements automatic saving of scorers hits maps in a file using G4 analysis triggered by UI command
  - Monitoring example
- Introduce classes which use Geant4 classes together with analysis
  - *This would make geant4 kernel catagories (digits_hits, run, ...) dependent on analysis - what was found not acceptable*
- A new design iteration of scorers + analysis is under discussion with the architectural team
- The G4* classes in monitoring example will we kept in the example in 10.3. and their integration in Geant4 kernel will be postponed to the next year