



Opening addresses / open requirements:

Nuclear physics domain

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21th Geant4 collaboration meeting
September 2016



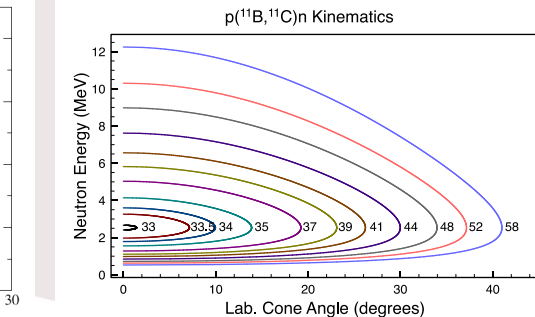
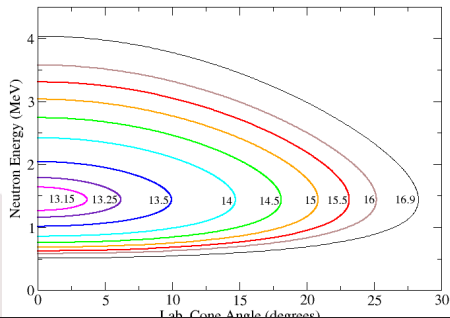
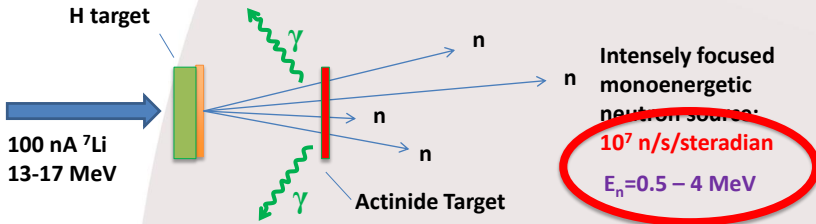
USE OF GEANT4 FOR GAMMA SPECTROSCOPY WITH LICORNE:

RESPONSE FUNCTION CALCULATION AND GEOMETRY STUDIES

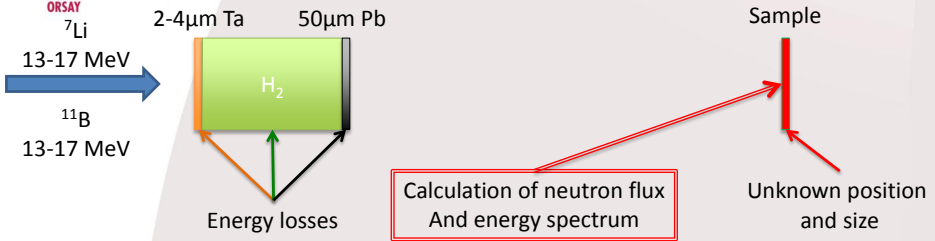


M. Lebois

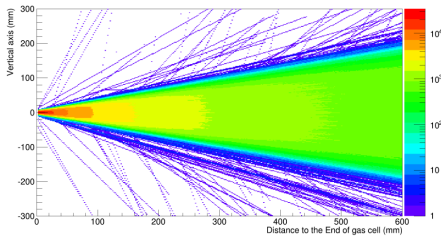
Lithium Inverse Cinematiques ORsay Neutron source



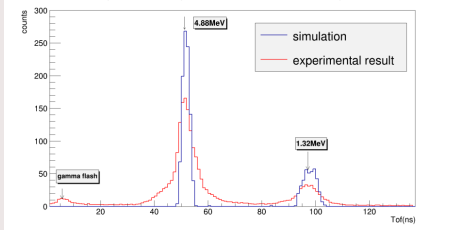
NEUTRON FLUX CALCULATIONS FOR LICORNE



Neutron flux in space



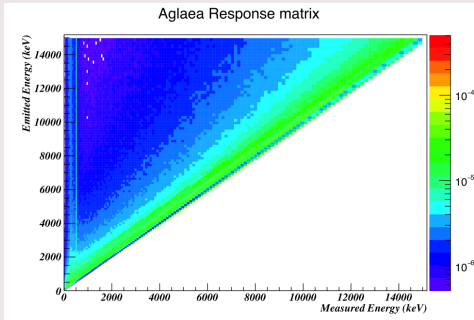
Comparison of ToF spectra between simulation and experiment



- Event bias mandatory:
- Force Collision & increase yields
 - Increase cross section & renormalise

} Done "by hand"

Experimentally
Measured
Spectrum



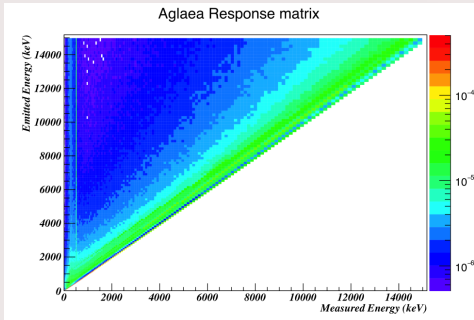
Really
Emitted
Spectrum

GEANT4 Simulation of Gamma Response Matrix in each detector

- Simple Gamma Tracking in sensitive Detectors
- Recursive simulation using scripts language
- Difficulties to validate using standard “Radioactive Decay”

↳ Rebuilt standard gamma source spectra by myself

Experimentally
Measured
Spectrum



Really
Emitted
Spectrum

GEANT4 Simulation of Gamma Response Matrix in each detector

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- ✓ Versatility : New physics processes, any kind of detectors
- ✓ Exhaustive information in the simulation accessible: detailed tracking

- Geometry visualisation: cannot handle too complex solids

- ✗ Growth of the number of files: TrackerSD, TrackerHit, EventAction, RunAction, SteppingAction...

- ✗ Information Access on how to compute a geant4 simulation: difficult for a beginner, not to say impossible without an experienced mentor (M1-M2, PhD Students)

Status and Progress on Requests from the Cosmic and High Intensity Frontiers

Dennis Wright
Geant4 Technical Forum
2 October 2015

Requested Projects Recently Completed or Under Development

Cosmic Frontier

- Phonon and charge carrier physics
 - phonon and e/h model in Ge at 0 K is well-advanced
 - to be completed early next year
- Improved energy conservation for α and β decay channels
 - done
- Addition of low energy (α , n) reactions
 - done with addition of unified ParticleHP, available in 10.2
- GENIE-Geant4 interface for nuclear final state interactions
 - underway, starting with Bertini cascade interfaced to GENIE
 - ready late this year/early next

Cosmic Frontier

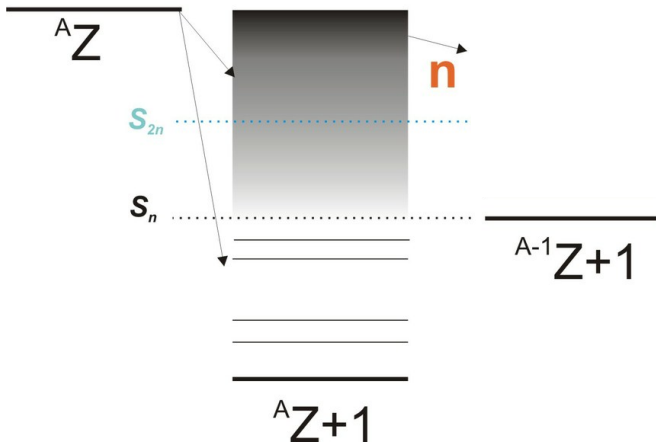
- Provide missing levels and lifetimes in radioactive decay
 - good progress, may be ready for 10.2

Projects Either Just Started or Not Yet Begun

Cosmic Frontier

- General improvement of RDM code including:
 - biasing
 - missing levels (if not done by 10.2)
- Add new RDM channels
 - β -delayed neutron emission
 - spontaneous fission

β -delayed neutron emission





Treatment of gamma cascades after neutron capture (Gd, Xe)

Export ▾

Details

Type:	Requirement	Status:	OPEN (View Workflow)
Priority:	Major	Resolution:	Unresolved
Affects Version/s:	None	Fix Version/s:	None
Component/s:	None		
Labels:	4004		

Description

Treatment of gamma cascades after neutron capture (Gd, Xe)
– LZ will have Gd-loaded liquid scintillator around TPC as veto

Activity

All **Comments** History Activity Transitions

▼ [Marc Verderi](#) added a comment - 08/Feb/16 11:00 AM

The patch on 10.2 should correct.

People

Assignee:	Dennis Herbert Wright
Reporter:	Marc Verderi
Additional Assignee:	Makoto Asai
Votes:	Vote for this issue
Watchers:	Start watching this issue

Dates

Created:	21/Jan/16 3:38 PM
Updated:	08/Feb/16 11:00 AM

THANK YOU
for your attention

