

Geant4 simulation on scintillator bars array (Setup as Dec2014 beam test in Notre Dame)

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(Based in Fermilab since Mar 2014)

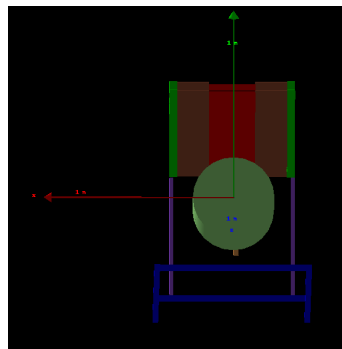
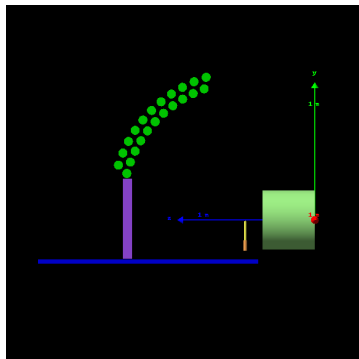
September 24, 2014

Outline

- 1 Introduction on setup
- 2 Preliminary results of “SDD + 22 scintillator bars ”
- 3 Summary and outlook
- 4 Acknowledge

Setup of 22 scintillator bars

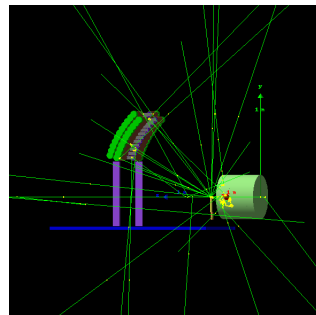
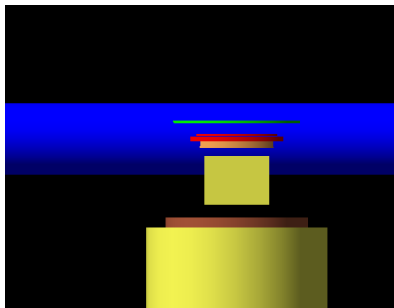
Scintillator bars , view from different angles.



More introduction

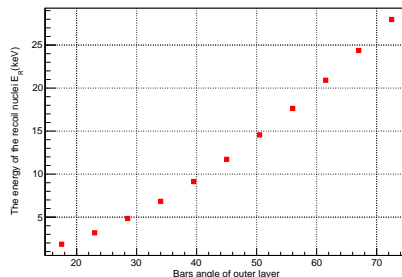
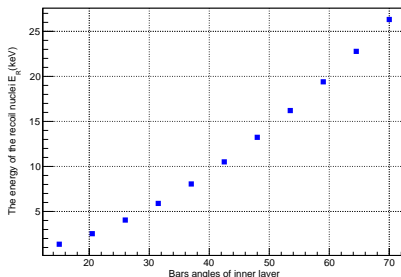
Left plot : inside view of SDD head(bigger red layer is the silicon detector layer).

Right plot : 100 simulated neutrons.



"Classic" calculation of recoiled energy of SDD

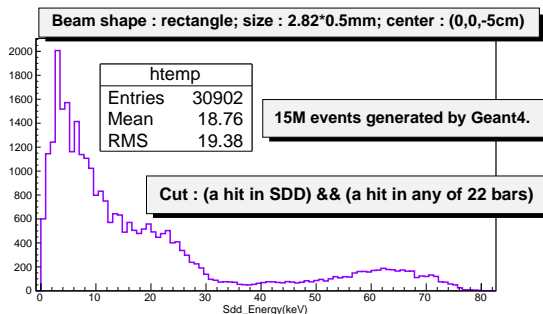
The deposited(recoiled) energies in SDD vs the angles of different scintillator bars.



Deposited(recoiled) energies in SDD with a cut

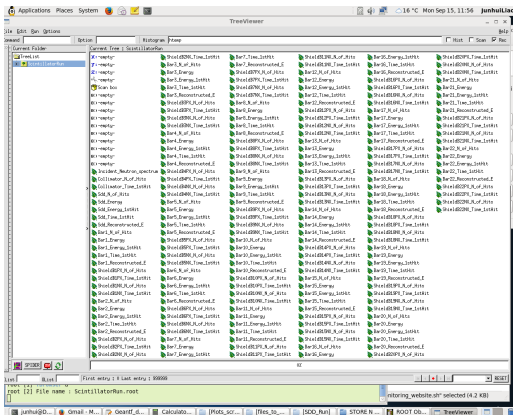
Beam information : shape is rectangle; size : same as the one view from the direction of incident neutron.

Cut : a hit in SDD and any of 22 bars.

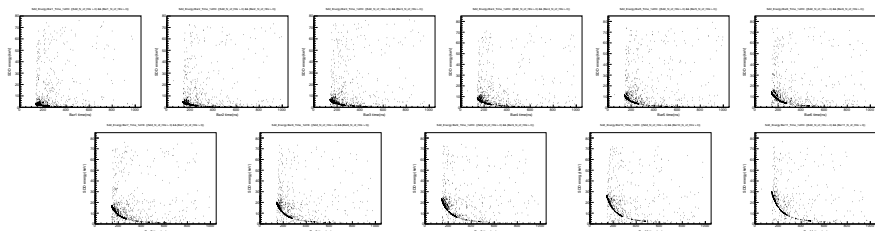


A clue on how many branches produced

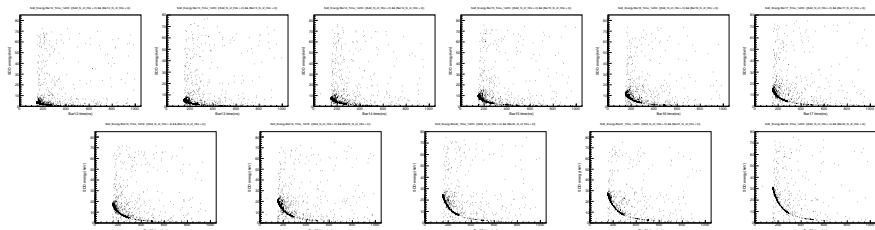
Over 200+ branches produced.



Deposited energy in SDD vs timing in bars(the 11 ones in the inner layer)



Deposited energy in SDD vs timing in bars(the 11 ones in the outer layer)



Summary and outlook

Summary

- For “SDD + scintillator bars array” setup, the simulation scripts have been finished. Using “artificial” beam, preliminary results are available.
- The results are well consistent with calculation according to the “classic” formula of recoil energy.

Outlook

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- Another simulation run in a cluster with "real" beam is supposed to be launched very soon(probably this week if everything goes well). It will take a few days to get the results.

Acknowledge

- This talk benefitted a lot from the discussion / instruction mainly from Gaston !
Also, thanks to the discussion with Marco !
- Besides, thanks to E.Chi to let me know the geometry the scintillator arrays.