

Simulations with Geant4

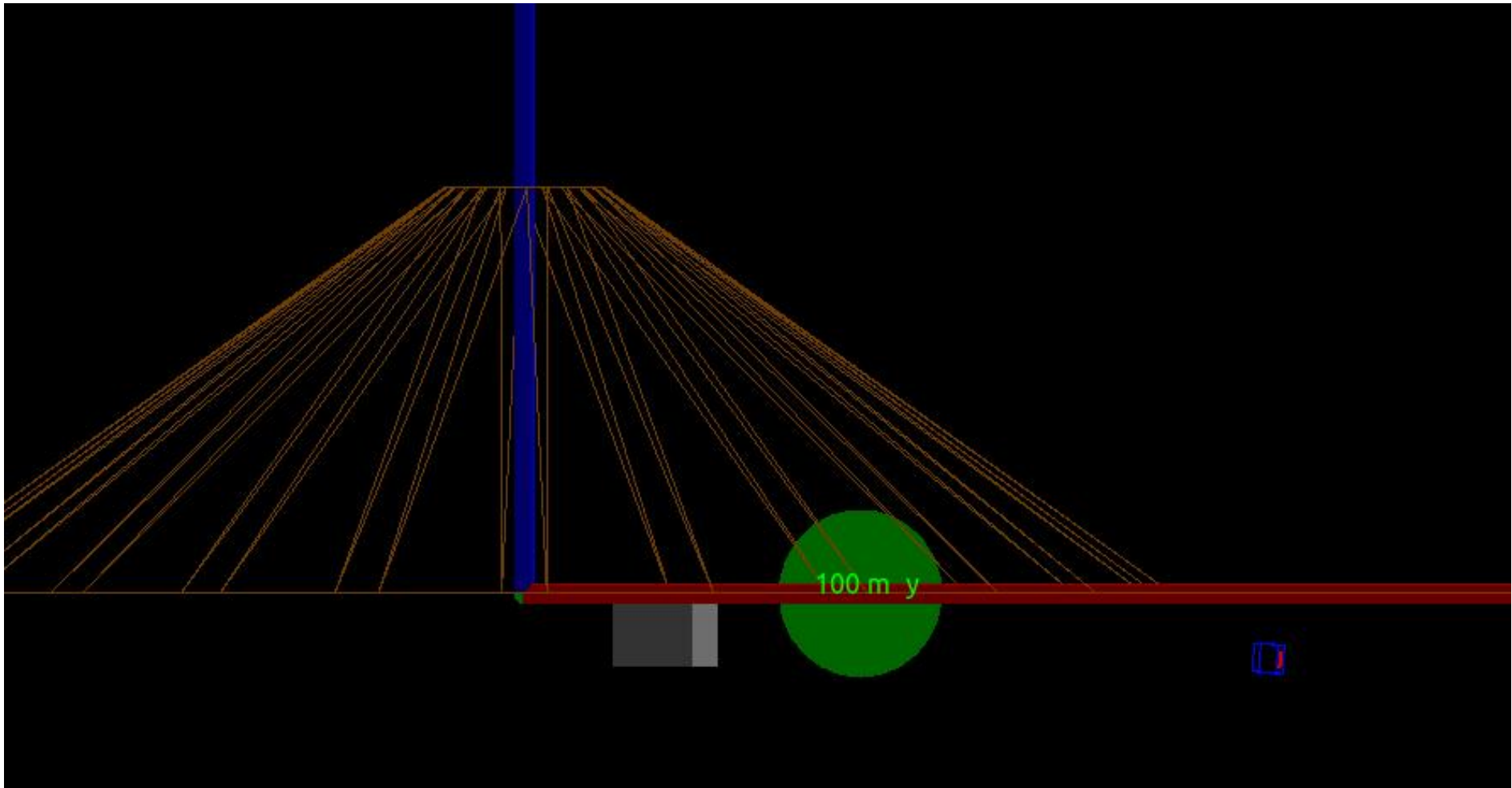
Alessandra, Héctor

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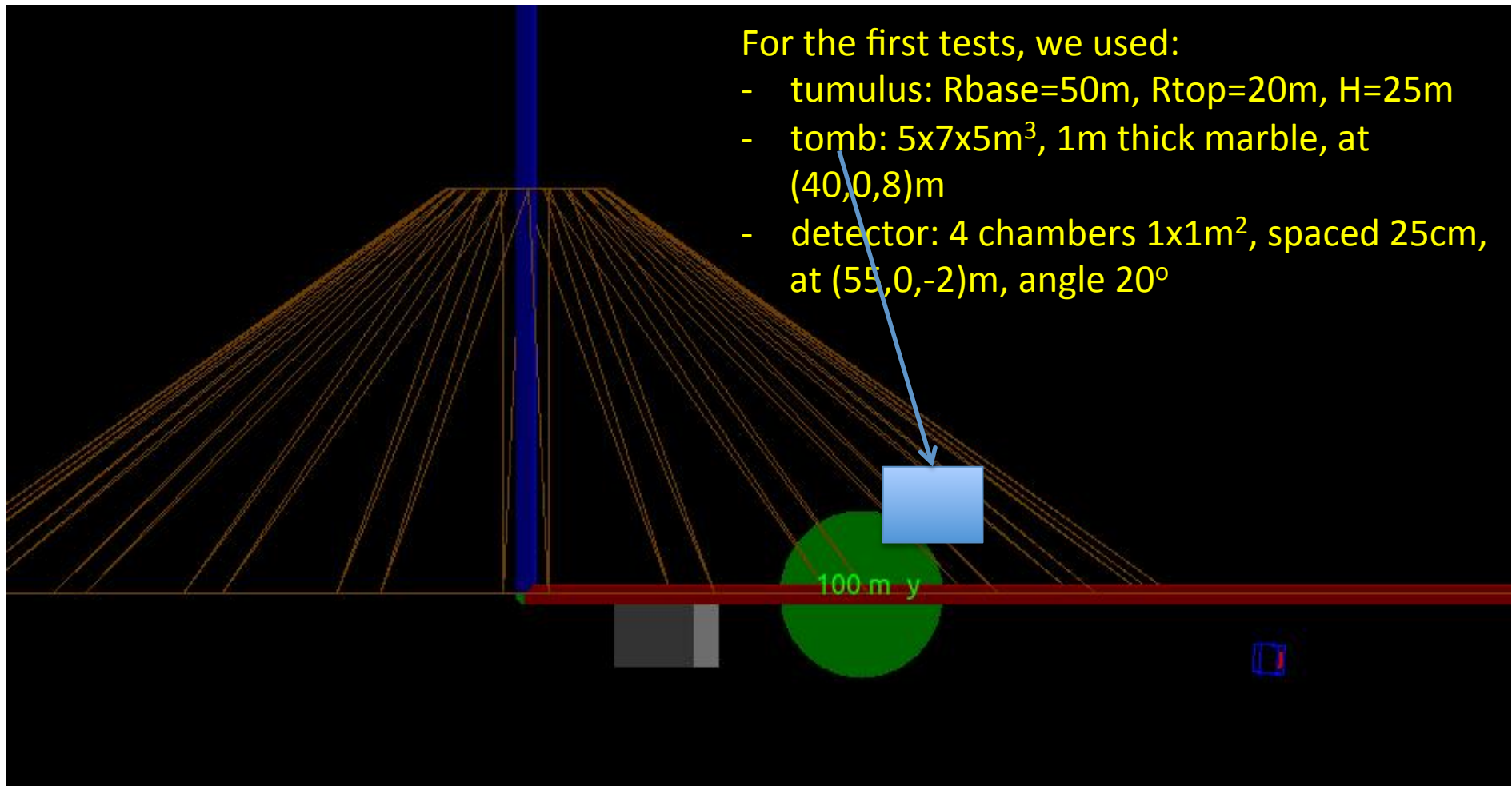
Geant4 Simulation

- developed by Jean Jacquemier and Yannis Kariotakis – LAPP
- full geometry of tumulus, tomb and detector
 - tumulus: truncated cone, set Rbase, Rtop, Height
 - tomb: parallelepipedus, set sides and thickness and position
 - detector: set Nb of chambers, chamber size, distance between chambers, position
- Muon generator: CRY (or fixed direction)
 - technical aspect: track and save only muons likely to cross the detector and with $E > 10$ GeV, in order to save computing time (1/500). Can run 3M events in 8-10 hrs (= 20min of data...)

Geant4 Simulation

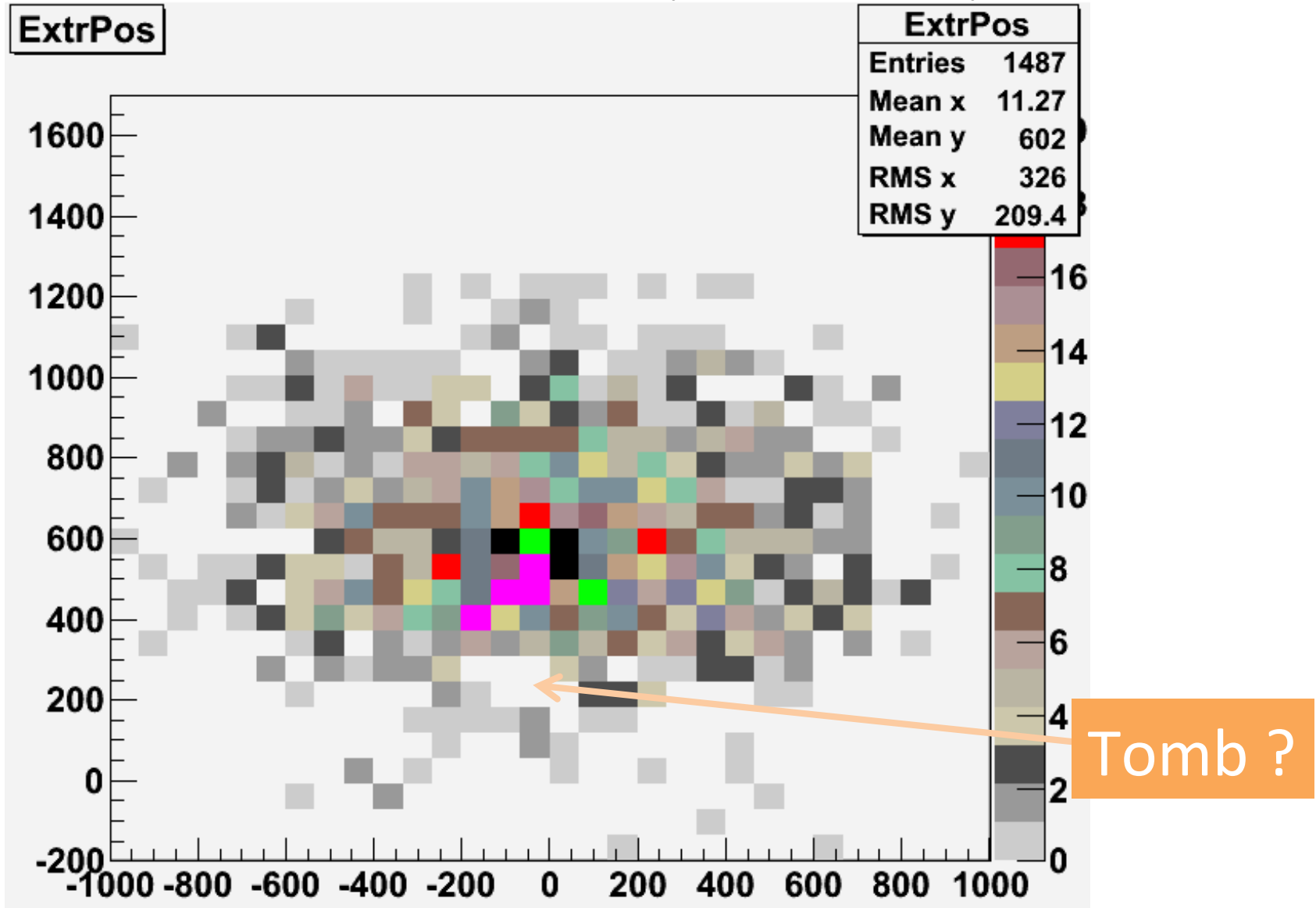


Geant4 Simulation

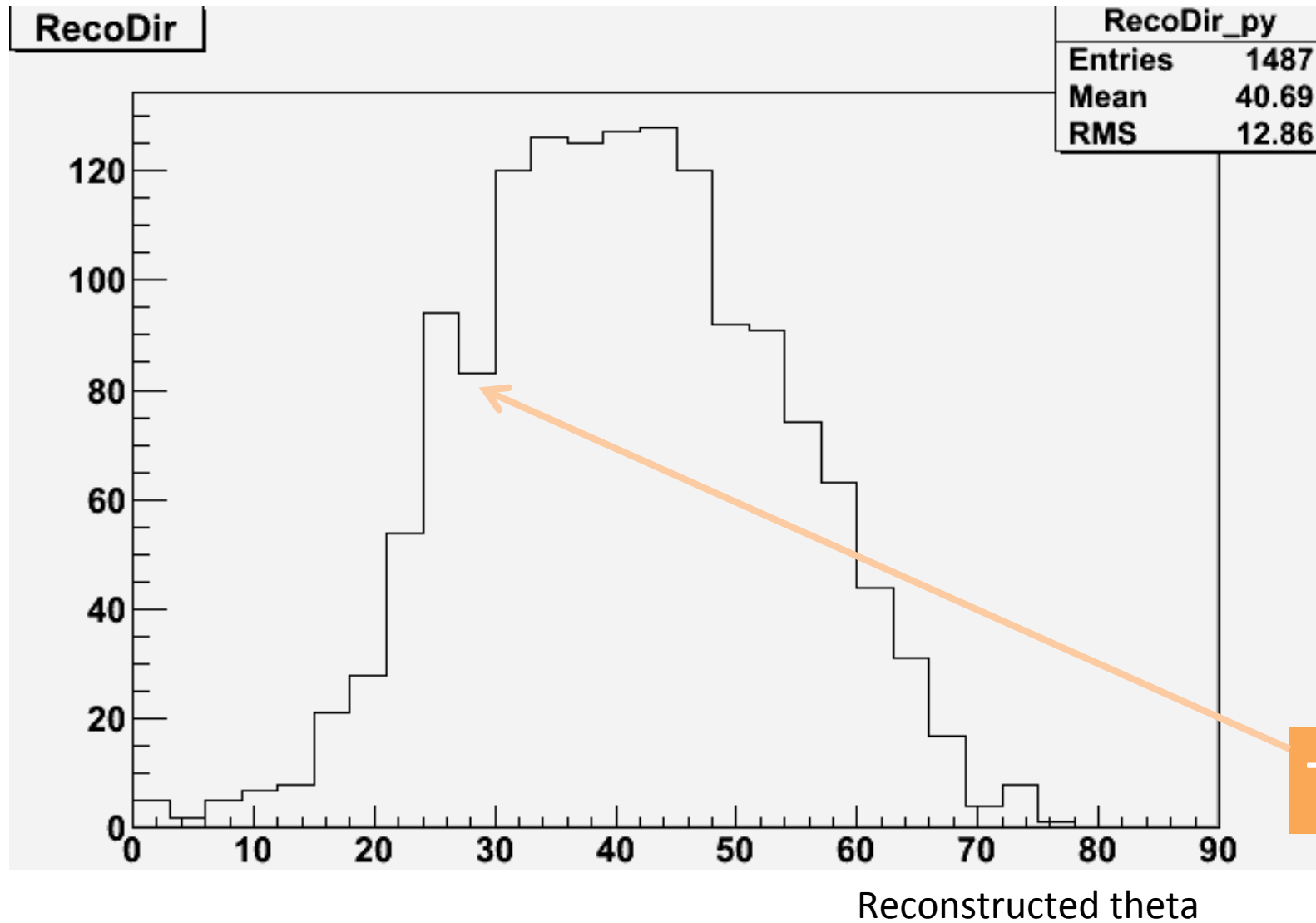


With 1M events

Reconstructed position in vertical plane at -20m

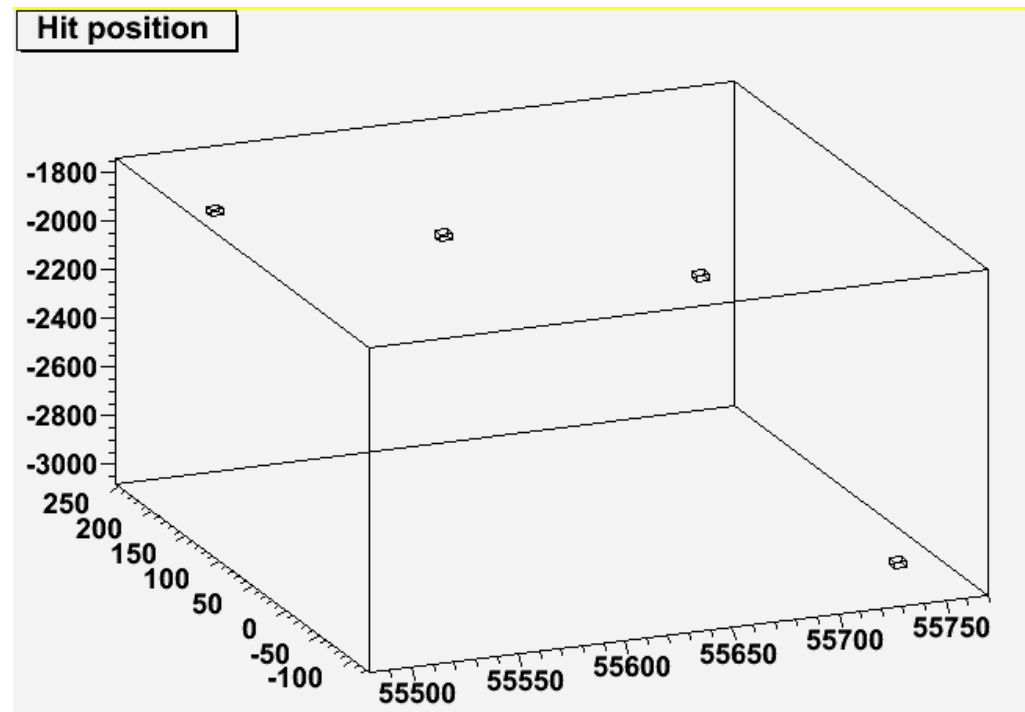


With 1M events



Direction reco

- Currently using straight line between hits in 1st and 4th chamber
- Obviously wrong !



- Need a realistic reconstruction algo

Summary

- We handle the full Geant4 simulation (thanks Jean and Yannis !)
- Computing time is reasonable, but still challenging for full statistics
- First plots available
- Ready for a “real” simulation, to study
 - detector resolution effects
 - backgrounds
 - inhomogeneity of the tumulus
 - etc...
- But first we need to understand HOW we see the structures