CPP Muon Detector Simulation

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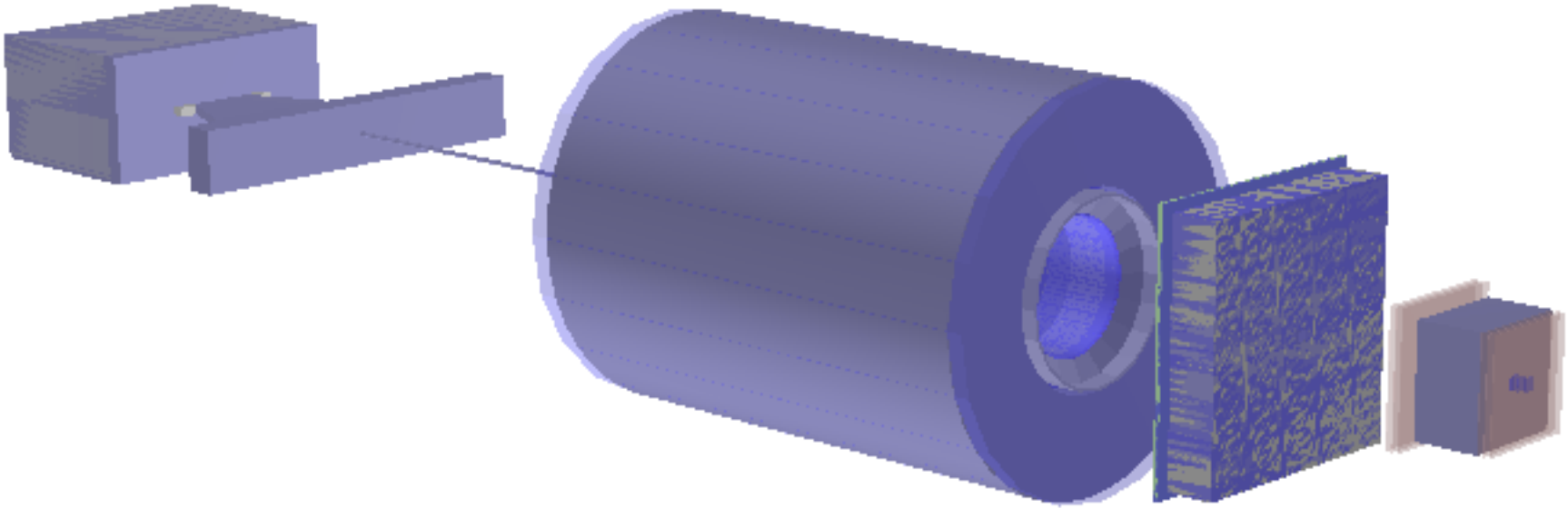
Geometry

- Geometry is integrated into full GlueX detector geometry
- 2 sets of chambers, 3 chambers per set
- Upstream chambers identified as layers 1,2,3 while downstream are layers 4,5,6
- 60cm of Iron between the two sets



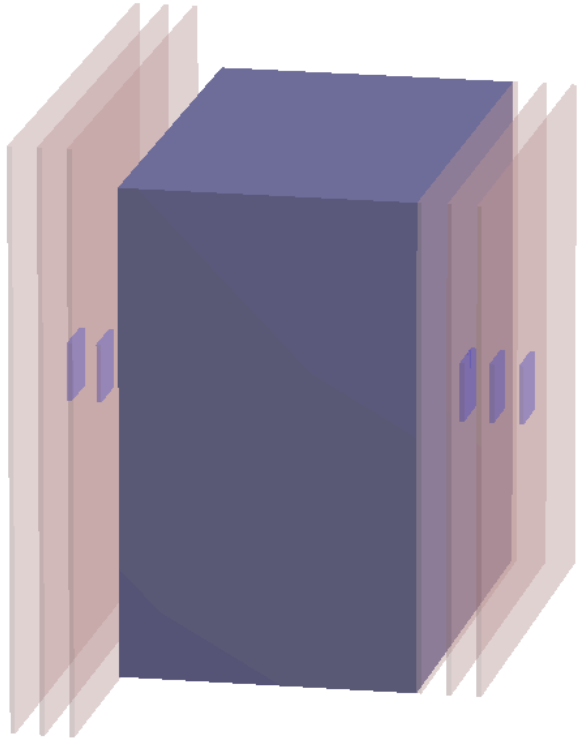
Geometry

From comments in ForwardMuonDetector.xml

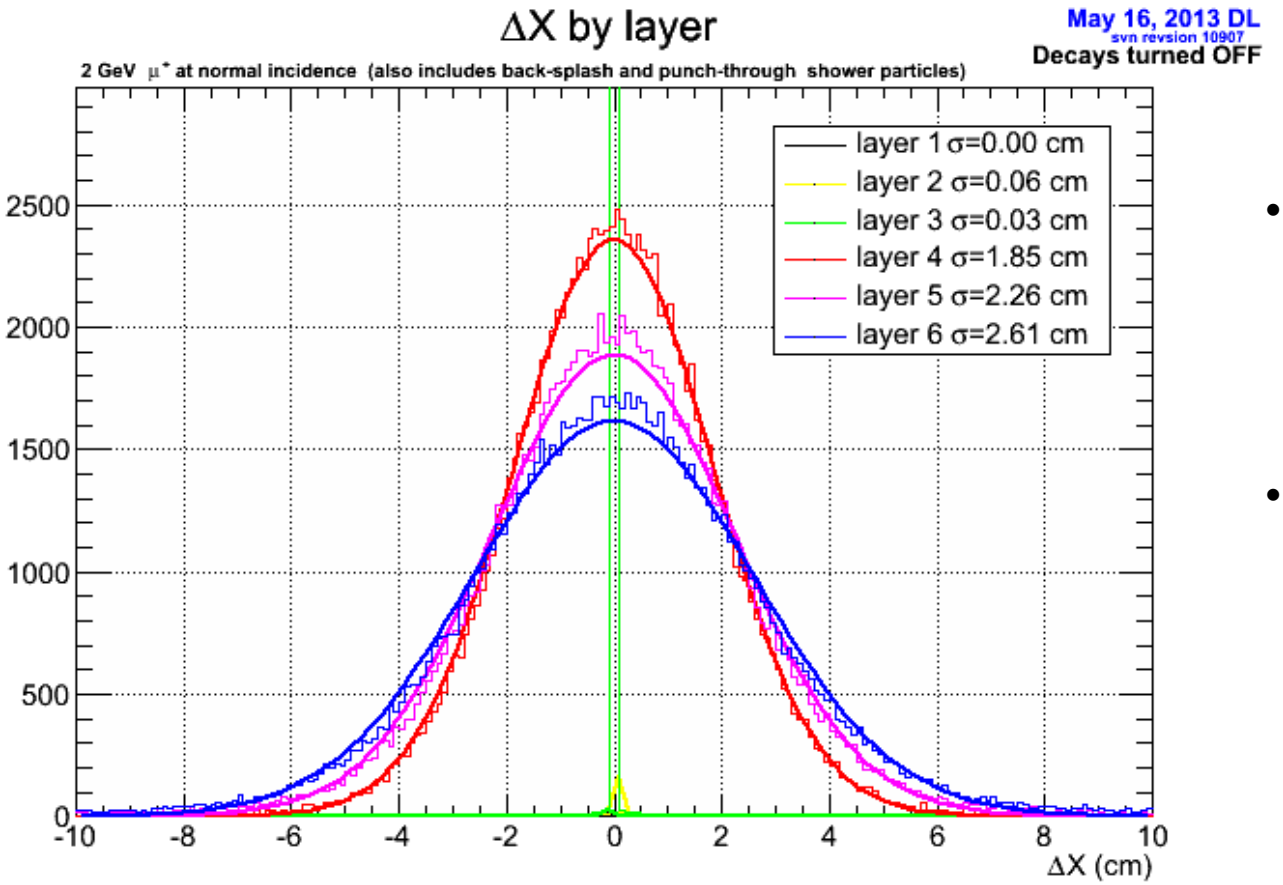
"MWPC1: 120x120 cm^2 cross-sectional area, 3 wire planes
IRON : 100x100x60 cm^3 (n.b. text says 60 cm but figure shows 50 cm!)
MWPC2: 100x100 cm^2 cross-sectional area, 3 wire planes

Note that while the text and figure indicate the chambers are 20 cm thick, we use 1cm thick gas volumes here, similar to the FDC. The chambers are separated by 5cm air gaps.

For the beam hole, we want a 12x12 cm^2 hole. To achieve this, appropriately sized volumes of air are placed inside the chamber and absorber volumes."



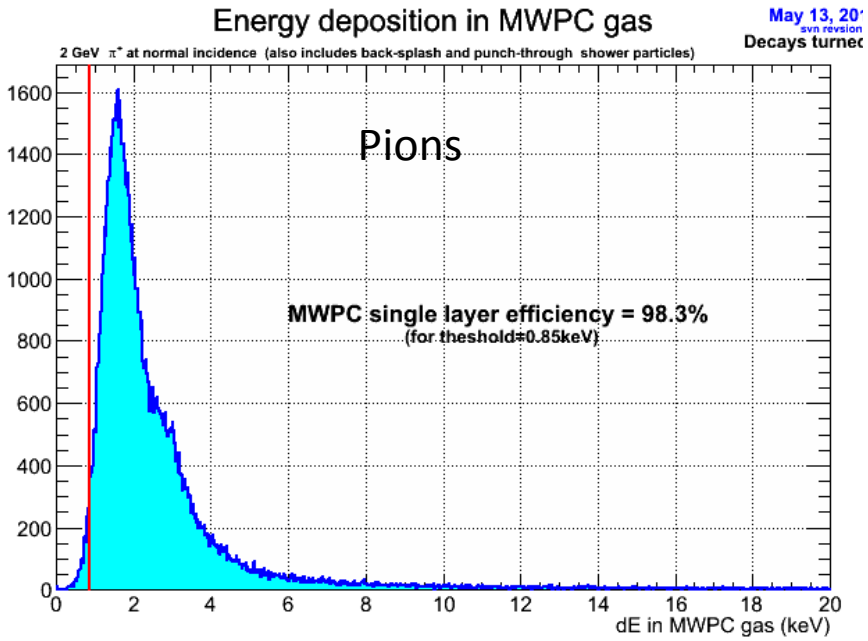
Muon position spread

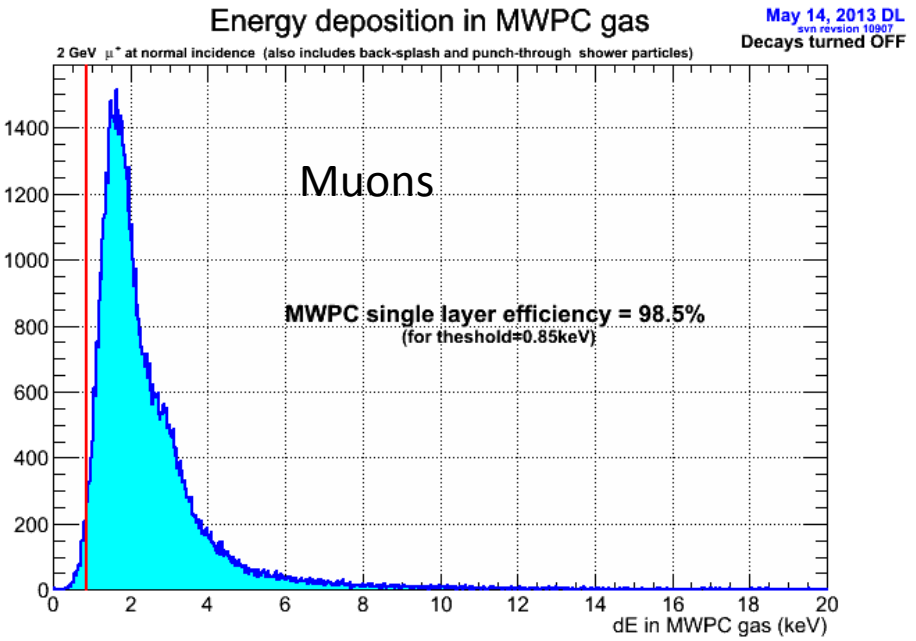


- Single muons were sent through the detector at normal incidence at x=25cm
- Difference bewtween hit locations in each chamber and generated trajectory are shown here

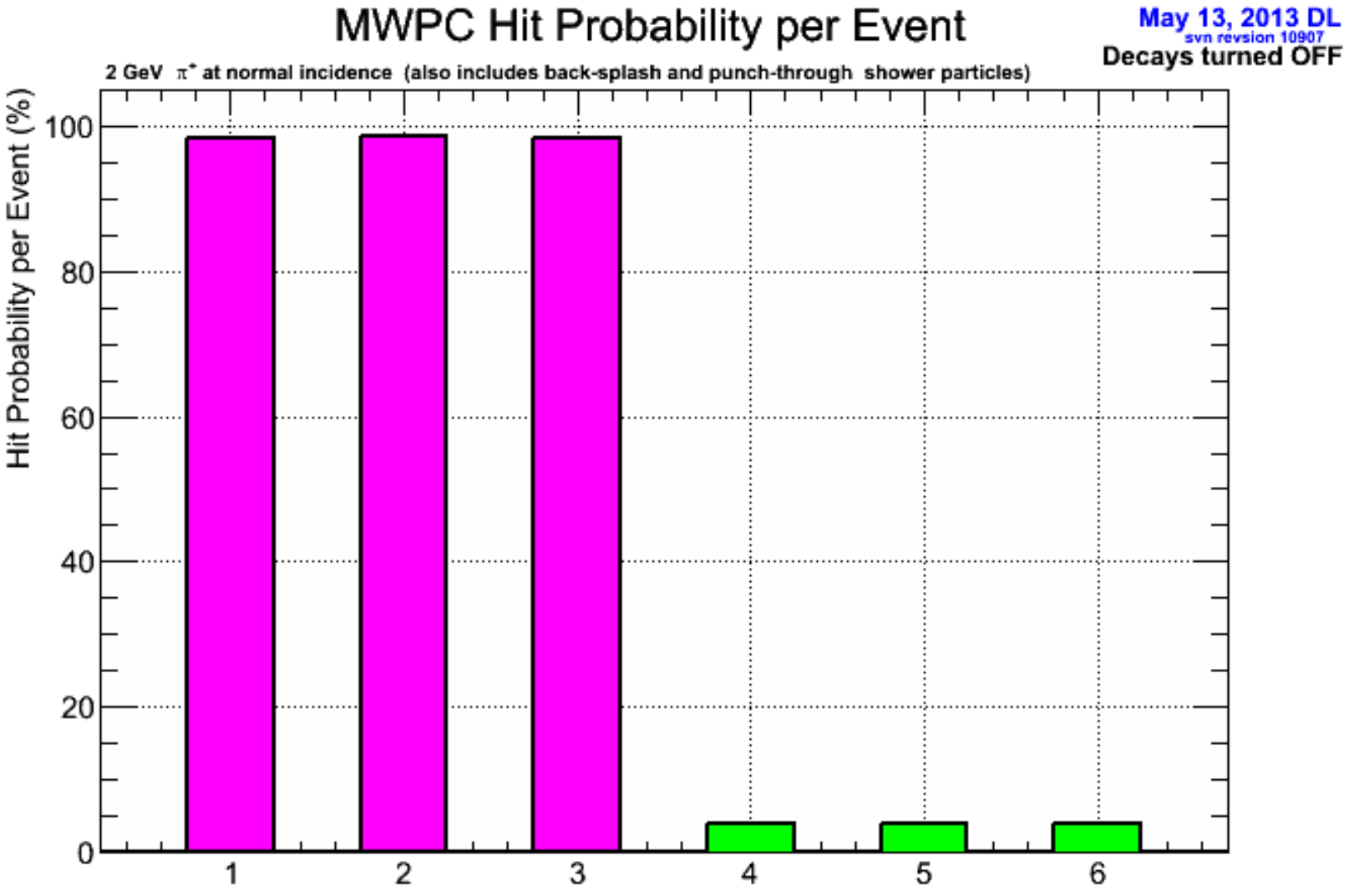
“Hit” definition

Hits defined by >0.85keV deposition in gas (same gas as used for FDC)

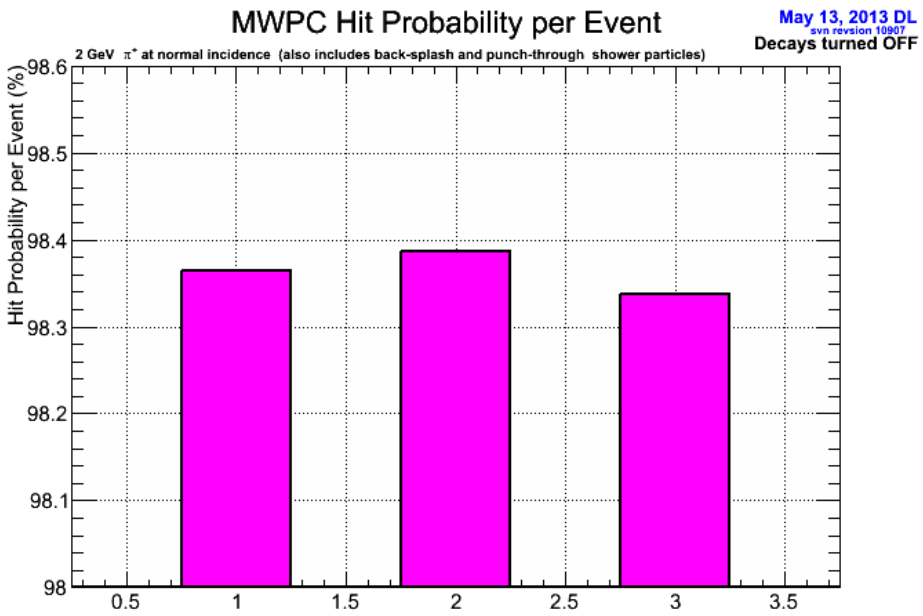


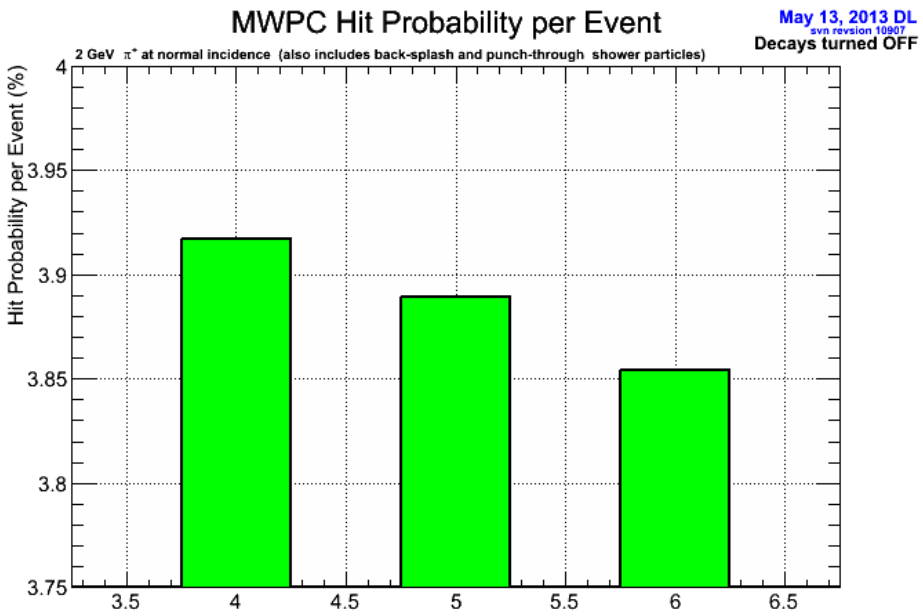


Pion hit probability by layer

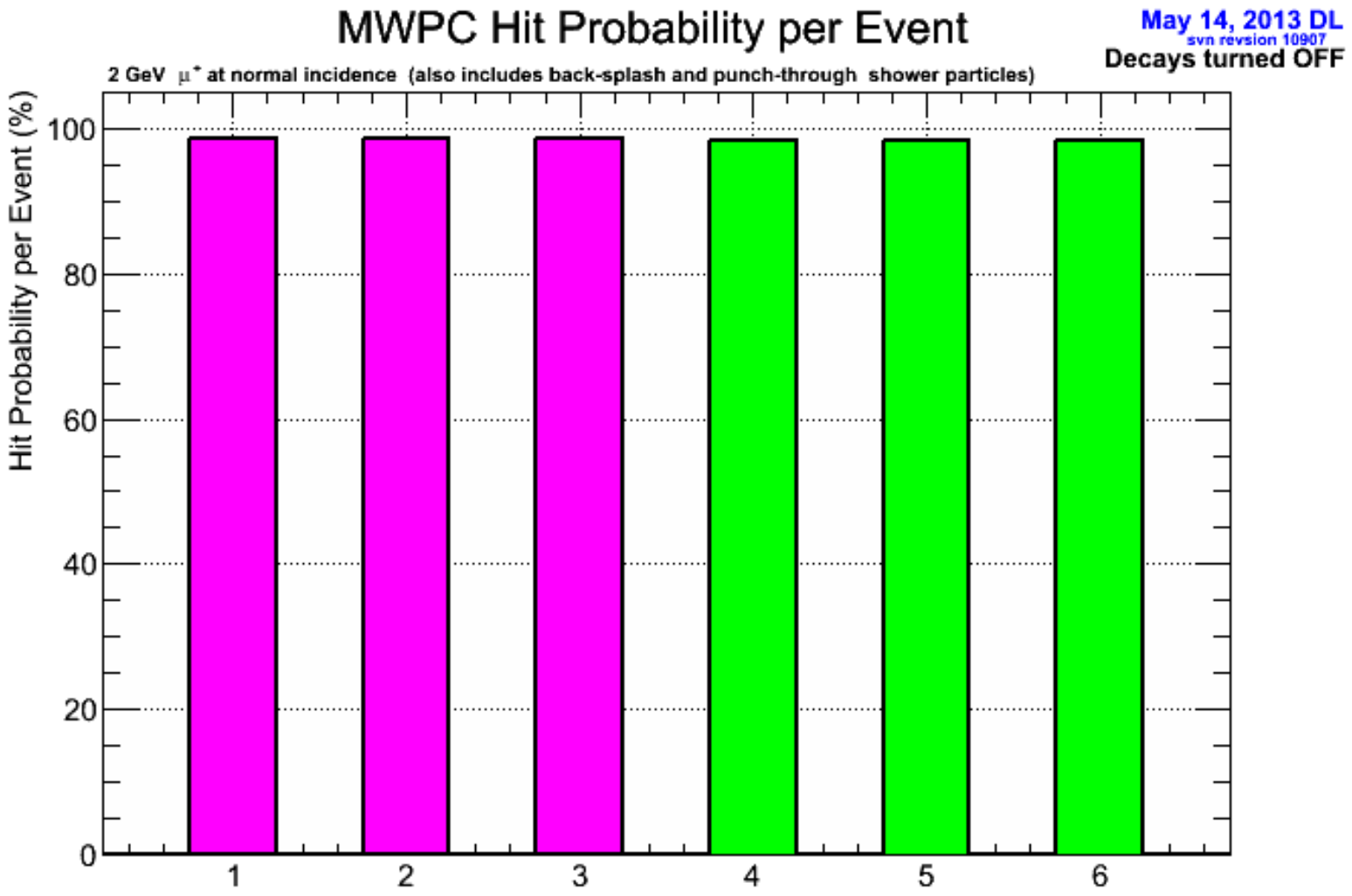


Pion hit probability by layer (zoomed in)





Muon hit probability by layer



Pion hit probability by layer (zoomed in)