PacTrk Status

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Bug Fixes

- Helix generation from point + direction
  - angles of exactly 0 produced NAN
- Cone intersection
  - occasional unphysical intersections
- Plane intersections
  - incorrect path lengths for helices
  - reversed path length through material
    - no intersections for backwards particles (temporarily)!
  - PacDetPlaneElem now ready for N-agon

Svt configuration

- Element order (old)
  - caused loss of hits in layer 4
- MAPS resolution
  - now 10 µm X 10 µm, was 10 µm X 14 µm
- MAPS material
  - added additional bus material (Al + Kapton, 0.17%)
- File organization
  - was: separate files for resolution, geometry
  - now: resolution + geometry in same file
    - Si_SuperB.xml and Si_BaBar.xml

General Configuration

- Configuration files now sourced using a search path
  - ./, RELEASE, PARENT, ...
- Can modify configuration by copying files to workdir *with their package*
  - ie, in workdir, mkdir PacTrk, then copy PacTrk/Si_Superb.xml into it

PacSim showering

- Showering described by (abstract) PacShowerModel class
  - PacEMShower and PacHadShower subclasses
  - Can subclass for specialized shower (CsI vs LYSO)

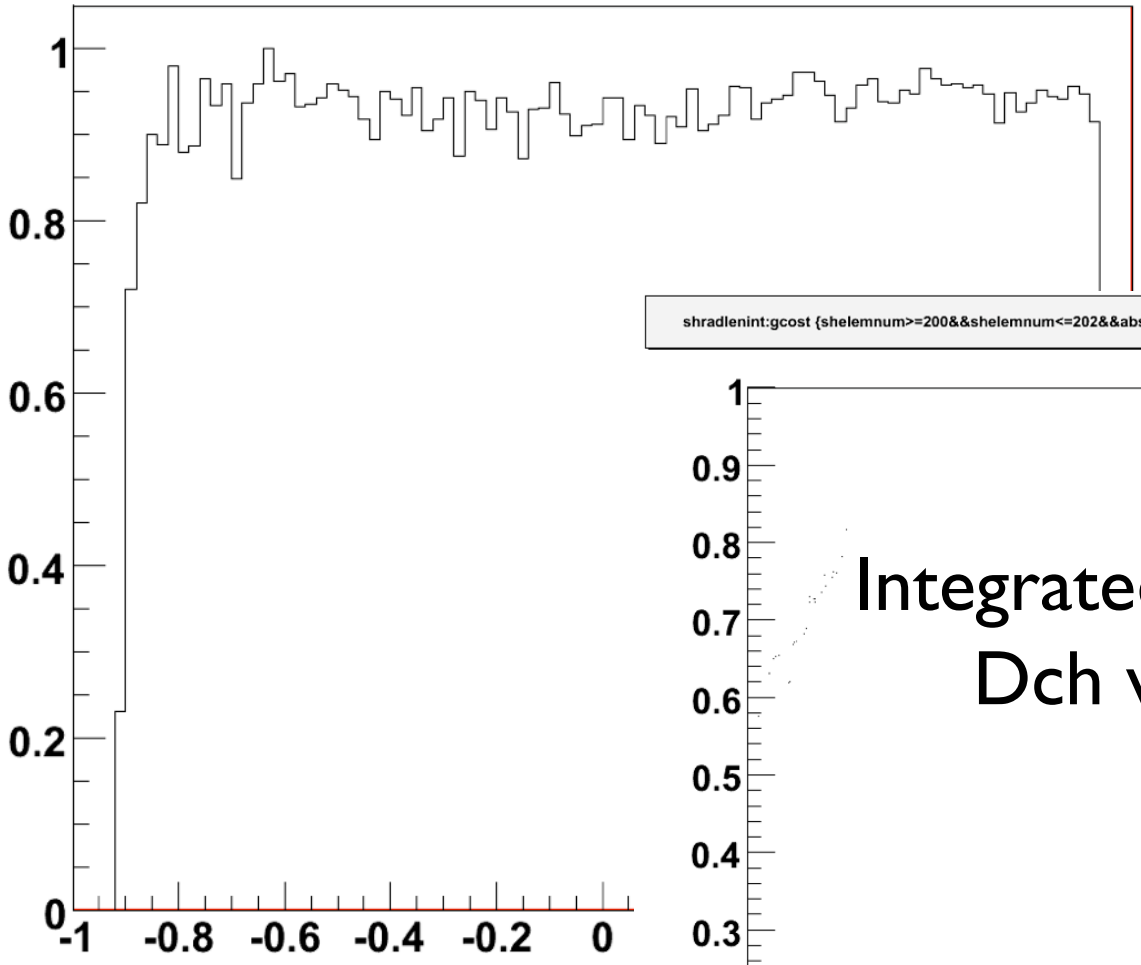
Shower Modeling Problem

- PDG shower shape depends on material Z
  - assumes showering in homogenous material
- Shape changes when showers cross materials
  - old model: match showers by X_0
    - problem: shower profile becomes discontinuous!
  - new model: match showers by dE/dX_0
    - problem: shower no longer has unit integral!
- Need a more physical solution
  - 'transition radiation' model

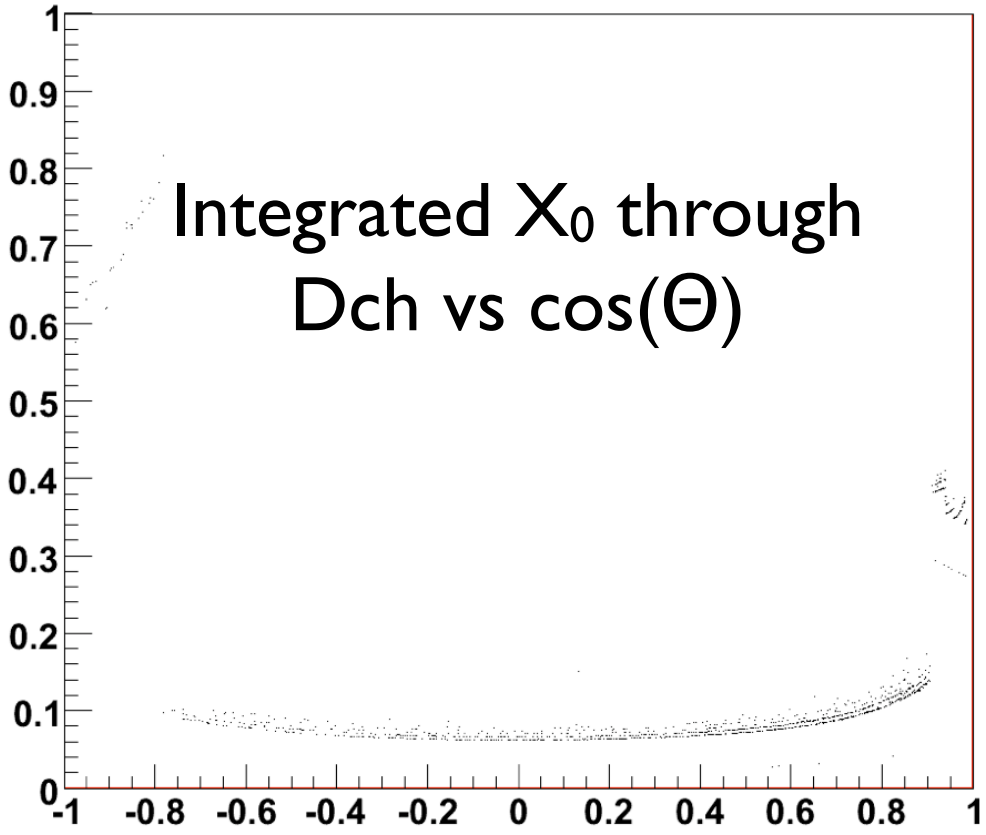
PacSimTrackTest module

- In PacQAApp
- Tuple ‘everything’ about a simtrack
  - all simhits
    - kind, position, energy loss, ...
  - associated reco track properties
  - associated GTrack + GVertex
    - particle type, momentum, genealogy, ...

Track reco efficiency vs cos(theta)



shradlenint:gcost {shelemnum>=200&&shelemnum<=202&&abs(goz)<0.2&&gorho<.2&&gmom>1.0}



Integrated X_0 through Dch vs cos(Θ)

Material Interaction Daughters

- PmcSimulate now creates daughters for γ conversion, bremsstrahlung
  - correct GTrack genealogy
  - daughters particles simulated + reconstructed
- caveat: daughters do not interact with the material that produced them
- NB: most interactions are in DIRC
  - Need cluster merging to simulate correctly!
- Hadronic interaction still to come