Using PacTrk and PacDetector in PravdaMC

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Outline

- PacTrk smearing
- Detector effects: Gtracks
- Detector effects: PacDetector

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PacTrk track smearing

- New calss PmcOpPacSmearing inherited from PmcOpSmear
- Implemented track smearing in ::fitParams(..) function using TrackGenerator and TrackReconstructor classes from PacTrk
- PacTrk uses BaBar KalmanFilter to determine smeared track parameters
- Can be selected from tcl in alternative to Trackerr

```
set TrackingSmearType Pac
set TrackingConfig RELEASE/PacTrk/pacrat.cfg
```

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- PravdaMC using StdHepTrk object to retrieve information on generated tracks
- Material effects => more sophisticated object: Gtrack & Gvertex
  - keeps track of how the particle was generated: generator, material interaction, etc. etc.
  - knows mother daughter relations
  - knows both the origin and the terminal vertex
    - useful to determine where to stop tracking a particle

Detector effects: GTracks

- Status
  - New module PmcBuildGTracks uses PmcStdHepConverter to build the GTrack list and put it in the event

```
mod talk BtaLoadMcCandidates
  requireGTrackList set t
  verbose set t
exit
mod enable PmcBuildGTracks
```

  - Enabled creation of MC candidates from Gtracks in BtaLoadMcCandidates => no more reference to StdHepTrk
  - The BtaMcTruth object will have instead a reference to the Gtrack, accessed as

```
mcCand->getGTrack()
```

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- A new object inheriting from PacDetector added to the event to simulate detector effects (multiple scattering, energy loss, track stopping)
- A track with detector effects will be represented by a new object: PacTrack

```
private:
  GTrack*                    _gtrk;
  const Trajectory*          _genTraj;
  std::vector<HepPoint>      _genHitList;
  TrkDifTraj*                _recoTraj;
```

```
_thePacTrack=detector->processOneTrack(_theGTrack);
```

- New particles can also be created and added to the list of GTracks with appropriate origin code