

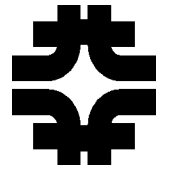
# GMINOS/DetSim Status

Robert Hatcher  
Fermilab Computing Division

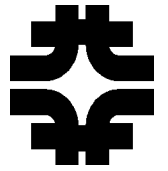
NearDet phone Mtg.  
November 16, 2005



# What's new

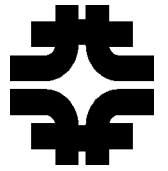


- GMINOS
  - Coil/Collar structure
  - BField map usage
  - New ESet/Dataflow
  - Other: NEUGEN3+Flux
- DetSim/PhotonTransport
  - Treatment of hole in NearDet
  - Treatment of snarl  $t_0$



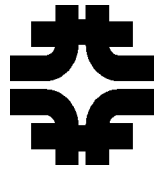
## Coil/Collar Structure

- Steel planes have a hole into which the collar “neck” is inserted. The “throat” of the collar is filled with coil material (and air).
- Between the steel planes the collar has a larger “flange”. For FarDet and NearDet full planes this is surrounded by a disk of “bypass” air; the flange on NearDet partial planes abuts the scintillator.



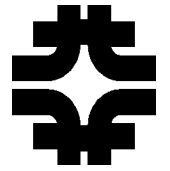
# Map Usage

- New handling of maps
  - multiple maps in memory simultaneously
  - regions
    - map for plane as a whole
    - map for steel detail ( $r=30\text{cm}$ ) around coil
    - map for flange detail ( $r=30\text{cm}$ ) outside steel
    - no field outside steel beyond flange detail
- Maps:
  - Near: 160 + 161 + 162
  - Far: 208 + 209 + 210 (don't exist yet)



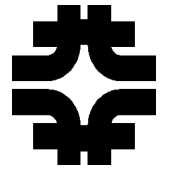
## Map Usage (2)

- This new modelling near the coil should improve MC vs. Data comparison even if reconstruction software does not use the detailed maps (in or out of steel). This new procedure makes the transport of particles through the detector more like real data and thus doing the same “wrong” thing in reco should be less important.



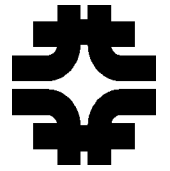
# New ESet/Dataflow

- FluxInfo ADAMO table (Eset)
  - duplicates all variables in main NEUTRINO common of gnumi column-wise ntuple
- New Dataflow (e.g. “record”) v007
  - pass FluxInfo and FluxWgt ESets
  - overlay processing must also handle these



# FluxInfo ESet

```
FluxInfo =
( FluxRun      = INTE : 'gnumi flux run number',
  FluxEvtNo    = INTE : 'gnumi flux event number',
  Ndxdz       = REAL : 'dx/dz slope, neutrino rndm decay',
  Ndydz       = REAL : 'dy/dz slope, neutrino rndm decay',
  Npz         = REAL : 'Pz of neutrino (GeV) rndm decay',
  Nenergy     = REAL : 'E(neutrino) (GeV) rndm decay',
  NdxdzNear   = REAL : 'dx/dz slope, neutrino NearDet center',
  NdydzNear   = REAL : 'dy/dz slope, neutrino NearDet center',
  NenergyN    = REAL : 'E(neutrino) (GeV) NearDet center',
  NWtNear     = REAL : 'Weight of nu NearDet center',
  NdxdzFar    = REAL : 'dx/dz slope, neutrino FarDet center',
  NdydzFar    = REAL : 'dy/dz slope, neutrino FarDet center',
  NenergyF    = REAL : 'E(neutrino) (GeV) FarDet center',
  NWtFar      = REAL : 'Weight of nu FarDet center',
  Norig       = INTE : '(ignore)',
  Ndecay      = INTE : 'Tag of decay mode',
  Ntype       = INTE : 'Neutrino type (translated to PDG)',
  Vx          = REAL : 'x vertex of hadron (cm)',
  Vy          = REAL : 'y vertex of hadron (cm)',
  Vz          = REAL : 'z vertex of hadron (cm)',
  pdPx       = REAL : 'nu parent px at decay point',
  pdPy       = REAL : 'nu parent py at decay point',
  pdPz       = REAL : 'nu parent pz at decay point',
  ppdxdz     = REAL : 'nu parent slope at decay point',
  ppdydz     = REAL : 'nu parent slope at decay point',
  pppz       = REAL : 'nu parent pz at decay point',
  ppenergy   = REAL : 'nu parent energy at decay point',
  ppmedium   = INTE : 'GEANT medium of nu parent at parent production',
  ptype      = INTE : 'nu parent type (translated to PDG)',
  ppvx       = REAL : 'nu parent production vtx x',
  ppvy       = REAL : 'nu parent production vtx y',
  ppvz       = REAL : 'nu parent production vtx z',
  muparpx    = REAL : 'if parent=mu, hadron parent px',
  muparpy    = REAL : 'if parent=mu, hadron parent py',
  muparpz    = REAL : 'if parent=mu, hadron parent pz',
  mupare     = REAL : 'if parent=mu, hadron parent energy',
  Necm       = REAL : 'E(nu) in parent cm',
  Nimpwt     = REAL : 'importance weight',
  xpoint     = REAL : '(unused)',
  ypoint     = REAL : '(unused)',
  zpoint     = REAL : '(unused)',
  tvx        = REAL : 'target exit point (x) of parent',
  tvy        = REAL : 'target exit point (y) of parent',
  tvz        = REAL : 'target exit point (z) of parent',
  tpx        = REAL : 'parent px at target exit',
  tpy        = REAL : 'parent py at target exit',
  tpz        = REAL : 'parent pz at target exit',
  tptype     = INTE : 'parent particle type (translated to PDG)',
  tgen       = INTE : 'parent generation in cascade'
) : 'Flux file information' ;
```



# Additional Changes

## ■ Flux

- handle v18 flux files
  - many more files (200+)
  - issues with POTs count in file
  - handle case where MARS/FLUKA transport drops info for muons that decay in the target itself (these can not be reweighted for x-y position and have Nimpwt=0)

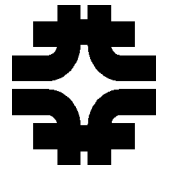
## ■ Neugen3

- Interface changes (handled by Mike K., thanks!)

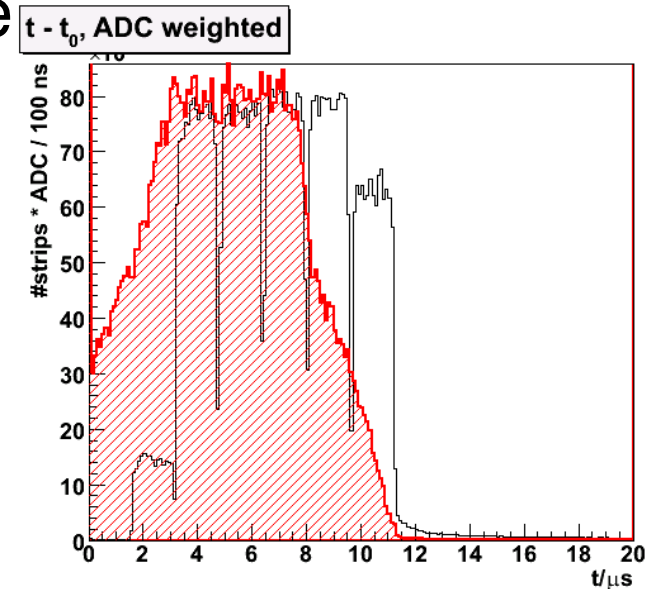




# DetSim/PhotoTransport



- Handling of cutoff near strip ends at bypass
  - See Masaki Ishitsuka talk on 2005-11-07 in Detector MC mtg.  
Study for the track issue in the ND MC
- Time of snarls
  - Not being handled this release





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## Present Efforts (other):

