

GLAST LAT project

Update on GLAST GSI 2003 beam-test

Study of hadronic interactions
1.7GeV protons

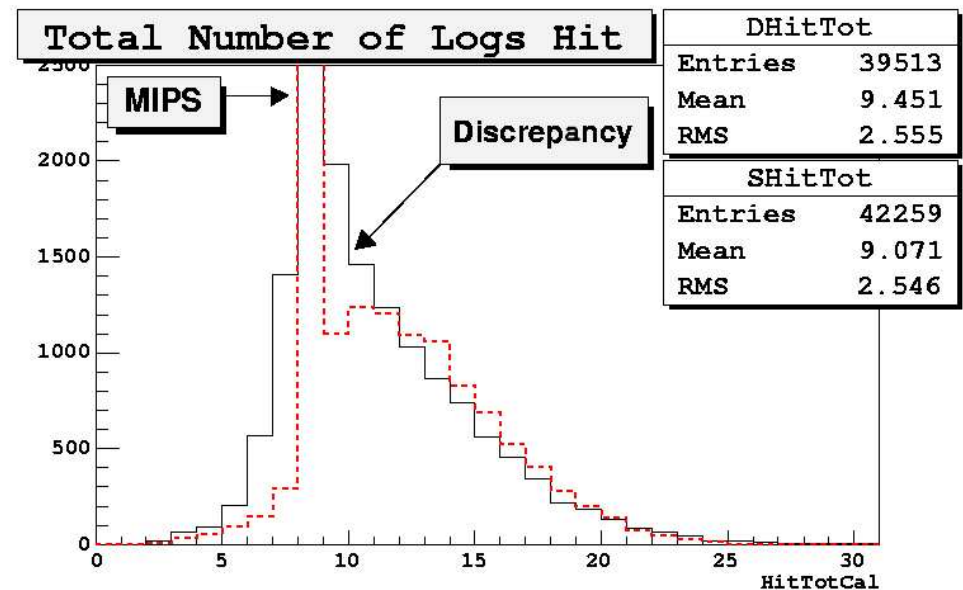
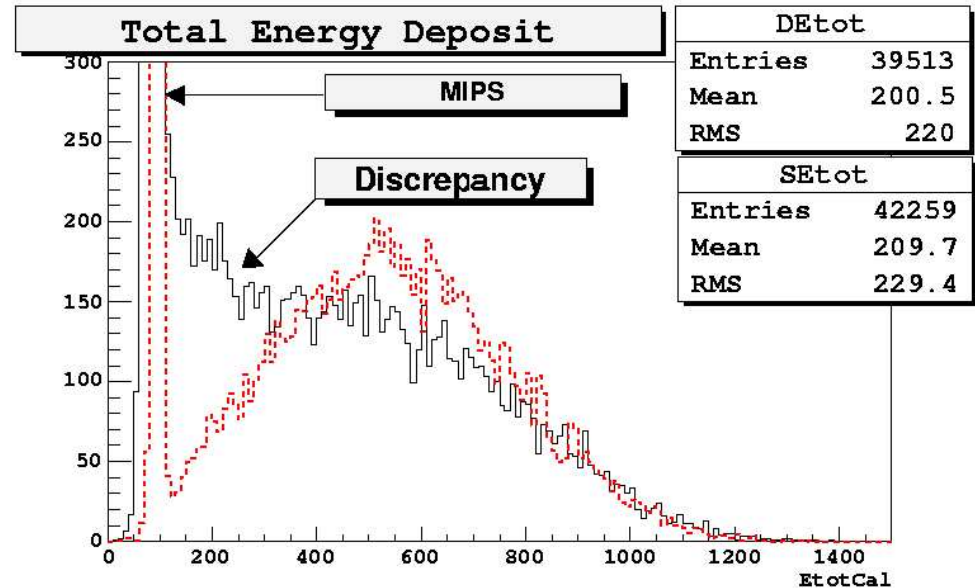
GSI - E.M. - protons 1.7GeV

Cuts to clean up beam

- on Layer 0 :
 $8\text{MeV} < E_{\text{log}} < 20\text{MeV}$ and
#Logs hit=1
- on Layer 1 : #Logs hit ≥ 1

⇒ Nice agreement for
Energy per layer and
number of logs hit per
layer...

⇒ ...but see Total en-
ergy deposit distribution



Testing special hadronic lists again...

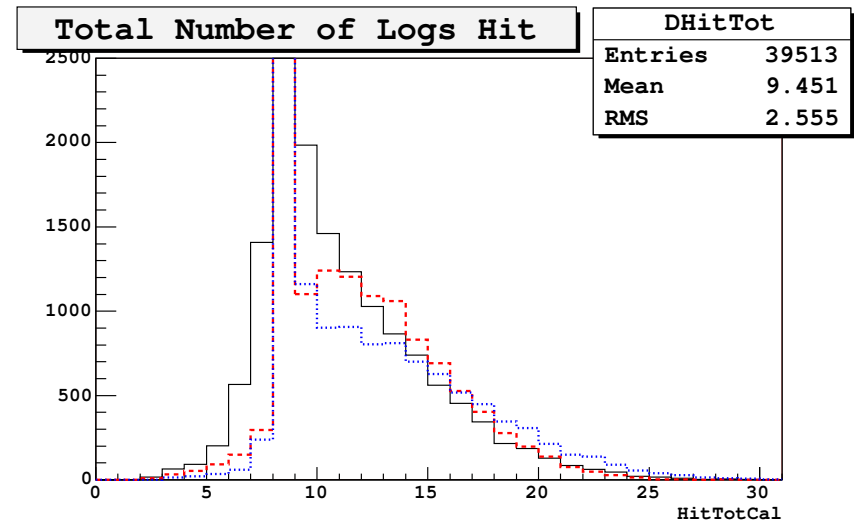
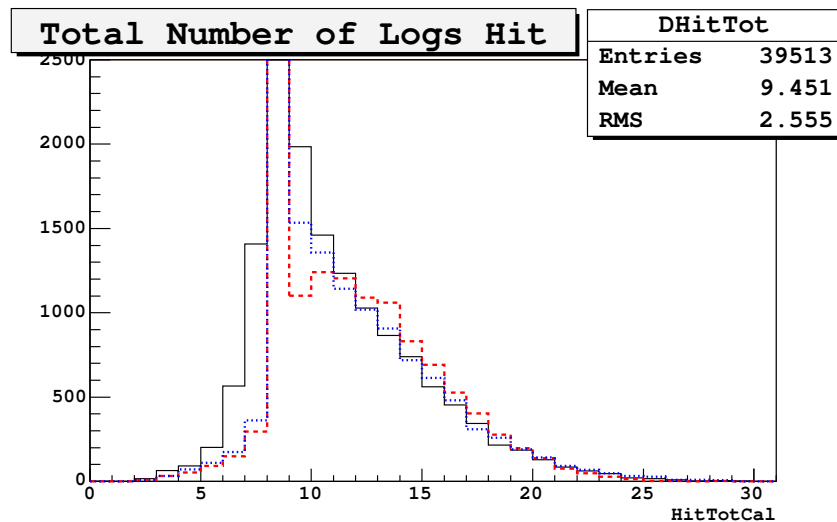
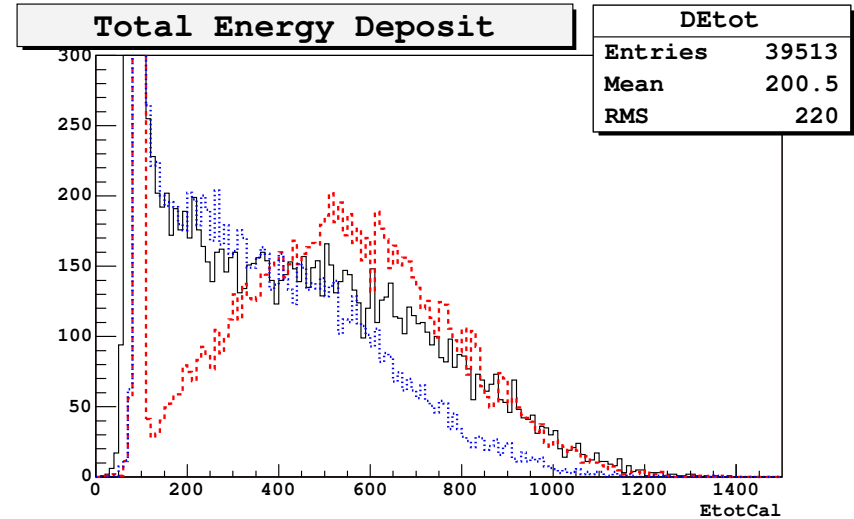
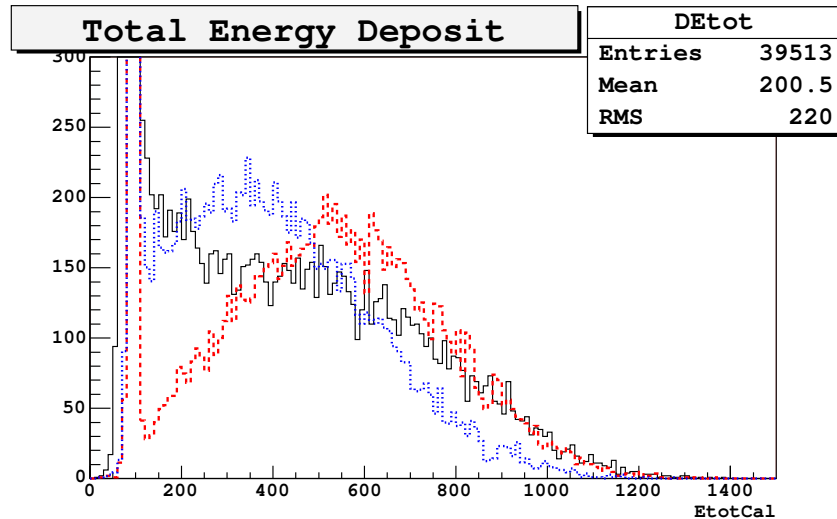
Table from G. Mavromanolakis, D. Ward, *Comparisons of hadronic shower packages*, Proc. of the ICLC, LCWS 2004, Paris.

G4-LHEP	GHEISHA ported from GEANT3	Different codes under 3GeV Only GHEISHA from 3GeV to 25GeV
G4-LHEP-BERT	$E < 3$ GeV Bertini cascade, $E > 3$ GeV GHEISHA	
G4-LHEP-BIC	$E < 3$ GeV Binary cascade, $E > 3$ GeV GHEISHA	
G4-LHEP-GN	GHEISHA + gamma nuclear processes	
G4-LHEP-HP	as G4-LHEP, for neutrons with $E < 20$ MeV use evaluated cross-section data	
G4-QGSP	$E < 25$ GeV GHEISHA, $E > 25$ GeV quark-gluon string model	
G4-QGSP-BERT	$E < 3$ GeV Bertini cascade, $3 < E < 25$ GeV GHEISHA, $E > 25$ GeV quark-gluon string model	
G4-QGSP-BIC	$E < 3$ GeV Binary cascade, $3 < E < 25$ GeV GHEISHA, $E > 25$ GeV quark-gluon string model	
G4-FTFP	$E < 25$ GeV GHEISHA, $E > 25$ GeV quark-gluon string model with fragmentation ala FRITJOF	
G4-QGSC	$E < 25$ GeV GHEISHA, $E > 25$ GeV quark-gluon string model	

- CERN data show that GHEISHA gives good results at 10GeV and 20GeV.
- For 1.7GeV protons, Bertini intra-nuclear cascade and Binary cascade models are of interest.

GSI - E.M. - protons 1.7GeV

Black = DATA + Red = Std G4



Blue = BERTINI

Blue = Binary Cascade

GSI - E.M. - protons 1.7GeV

Work to come :

- Still preliminary results to be confirmed...
- Working with "MIP finder" and "Background rejection" people to know more about the possible consequences of such a discrepancy
- Try cross section measurements... work in progress...not sure it can be done properly...