A new possible resonance at Belle

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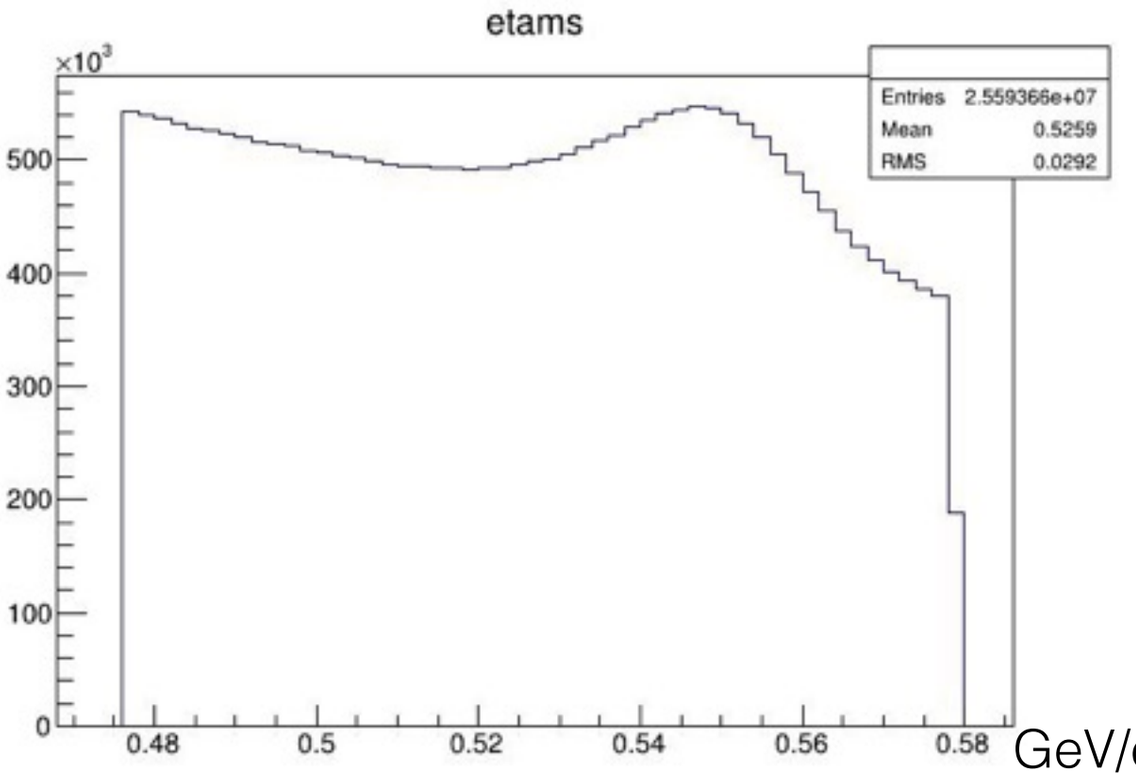
Analysis Progress

Working mostly on writing codes.

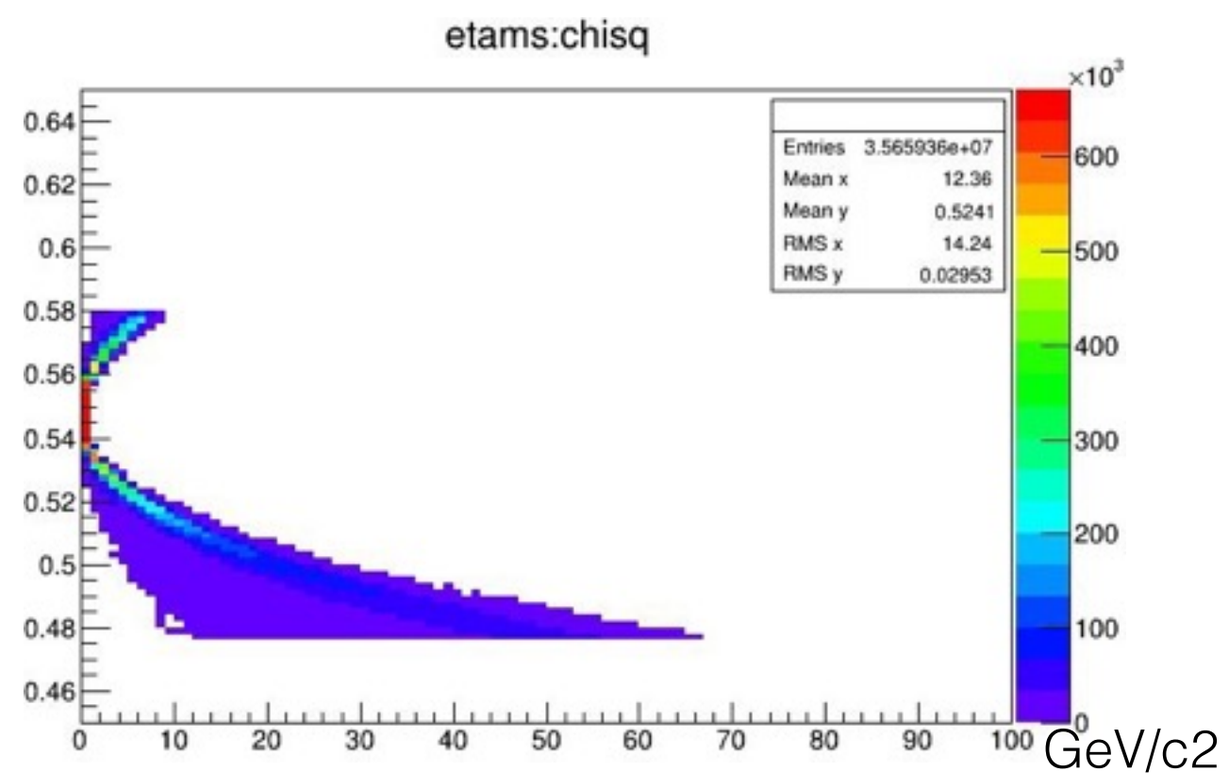
1. Eta reconstruction from two Gamma and three pions
2. Test Run for $\Lambda_c^+ \rightarrow \eta\Lambda\pi^+$ reconstruction
3. Signal MC (40000 events)

$$\Lambda_c^+ \rightarrow \eta\Lambda\pi^+ (\eta \rightarrow \gamma\gamma)$$

Eta from two gammas



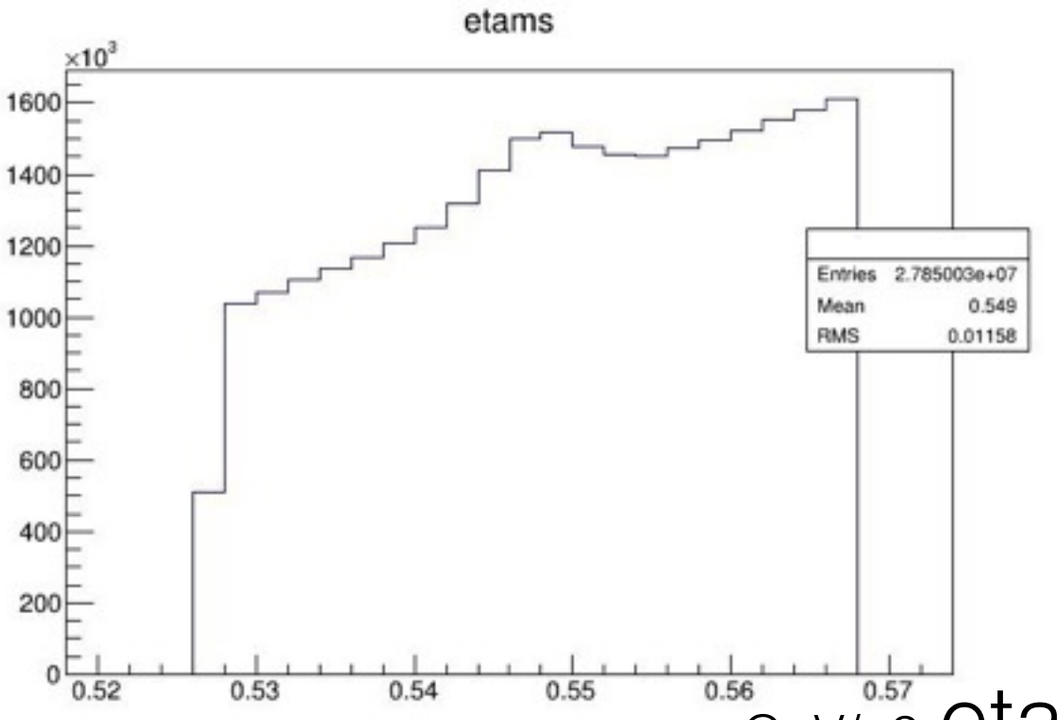
eta mass



eta mass vs mass constraint fit chi-square value

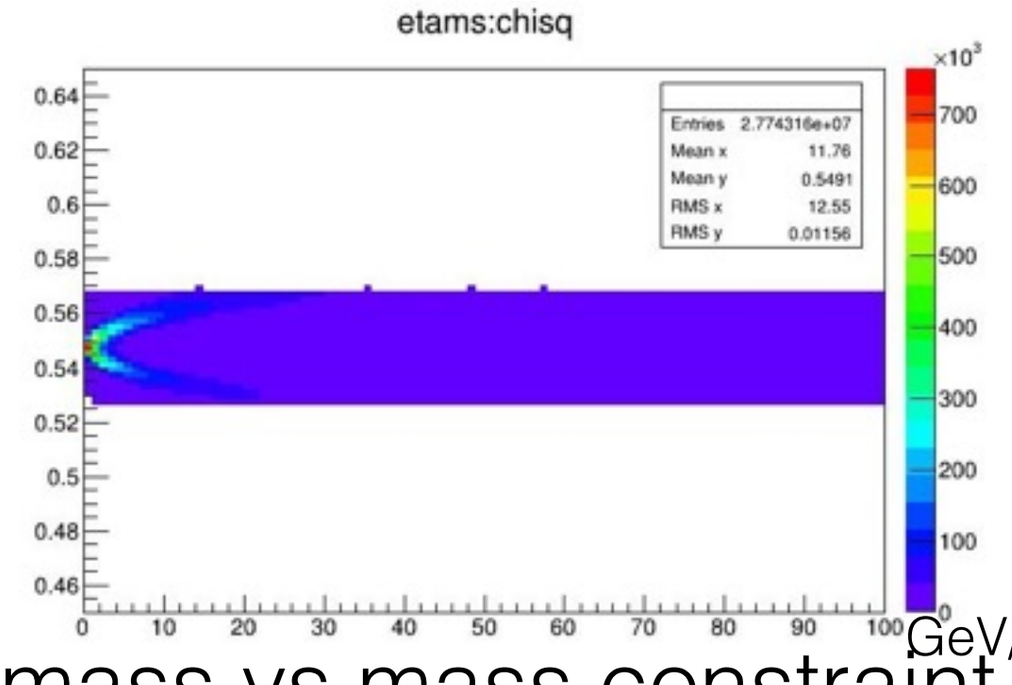
Cut: single gamma E in endcap region > 100 MeV, in Barrel region > 50 MeV, w/ pi0 veto
Data: exp73 whole data set

Eta reconstruction from 3 pions



GeV/c2

eta mass



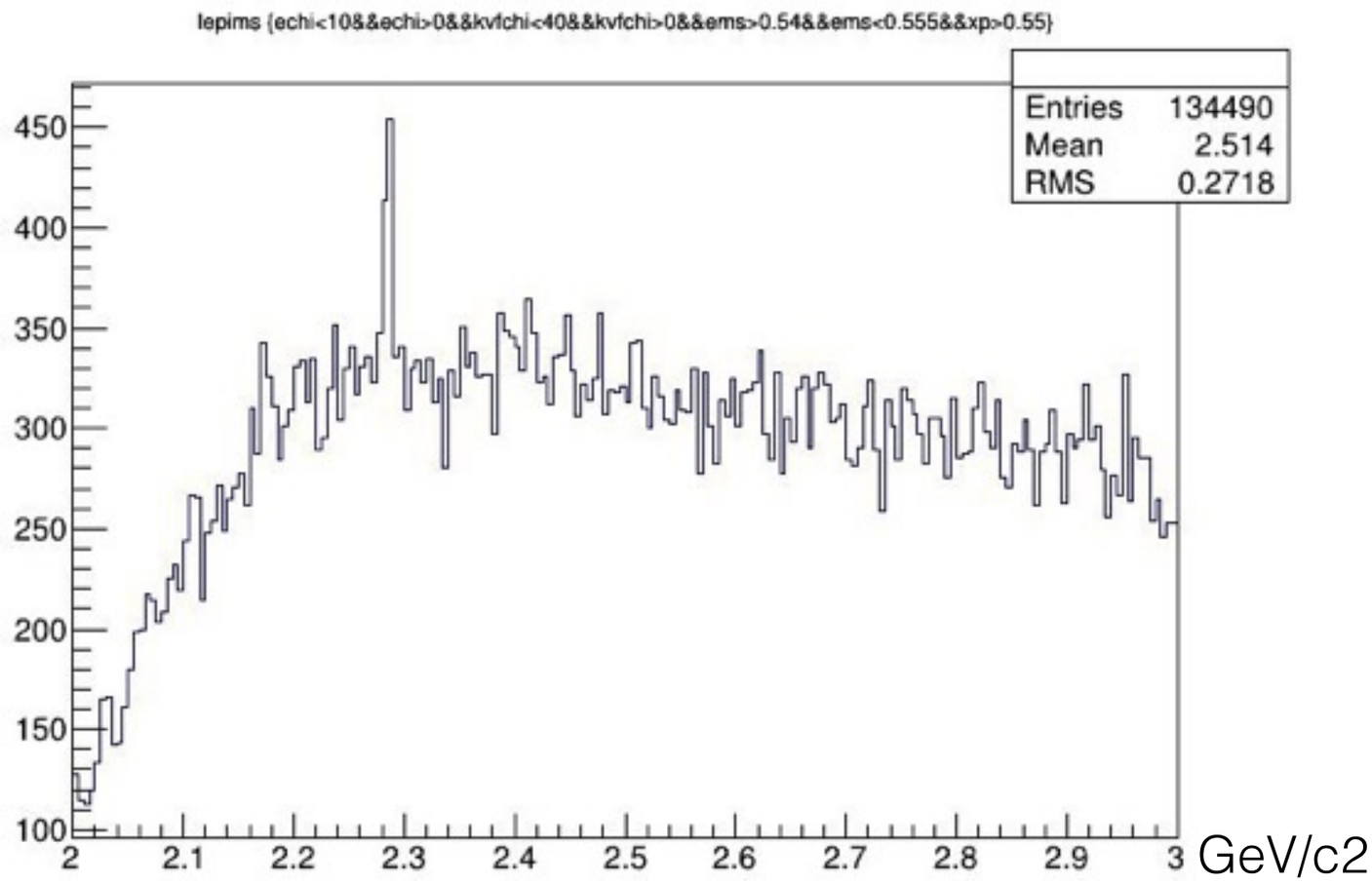
GeV/c2

eta mass vs mass constraint fit chi-square value

Cut: single gamma E in endcap region > 100 MeV, in Barrel region > 50 MeV for pi0
R(K|Pi) < 0.6, R(P|Pi) < 0.6, R(e)<0.9, nSVD>0,
impact parameter dr < 0.1 cm dz< 2.0 cm
Data: exp73 whole data set

Λ_c reconstruction test

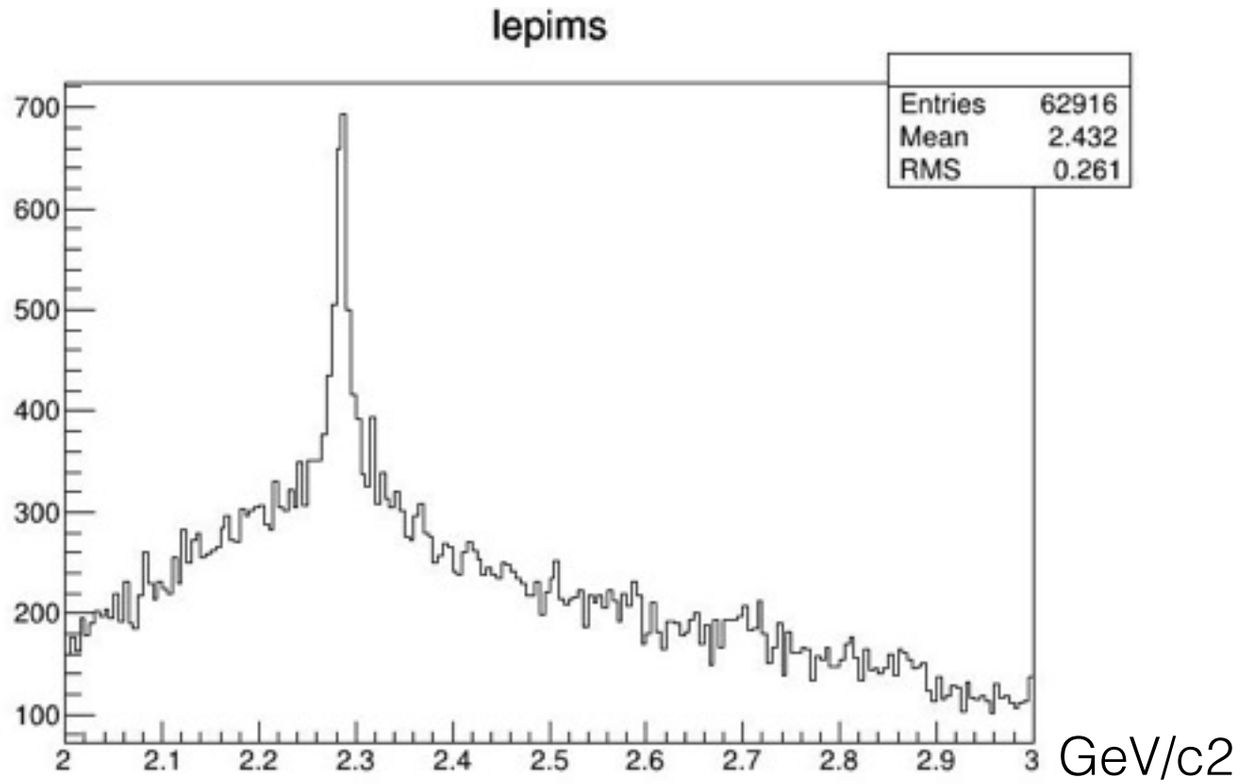
$\Lambda_c^+ \rightarrow \eta\Lambda\pi^+$ (1/30 of data)



1/30 of total belle data used.

Λ_c signal MC $\Lambda_c^+ \rightarrow \eta\Lambda\pi^+$ ($\eta \rightarrow \gamma\gamma$)

100%, 40000 events



Lambda mass

~1200 events in the signal region

1200/40000 = 3% (very rough est.)

Plan

- Background study (using real data set or generic MC)
- And optimize (signal from signal MC and side band background from data or generic MC)