Subject: some options for eta_c analysis
Posted by Dima Melnychuk on Tue, 11 Oct 2011 12:55:01 GMT
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Hi,

I have tried several options in eta_c reconstruction as its was suggested by Stefano and here are the results.

I used for analysis data on grid run 925oldnocu (release july11).

1. Instead of selecting best eta_c candidate after vertex fit (using its chi2) I tried a preselection of best candidate using chi2 defined as (totalreco_mass-etac_mass)^2/sigma(eta_c)^2+(phi1reco_mass-phimass)^2/si gma(phi)+(phi2reco_mass-phimass)^2/sigma(phi).

And here there is a small improvement in efficiency and eta_c resolution and no improvement in phi mass resolution (efficiency 24.0%, sigma(eta_c)=32.8 MeV, sigma(phi)= 3.92 MeV).

For comparison with selection of best candidate after vertex fit (efficiency 22.8%, sigma(eta_c)=33.2 MeV, sigma(phi)= 3.92 MeV)

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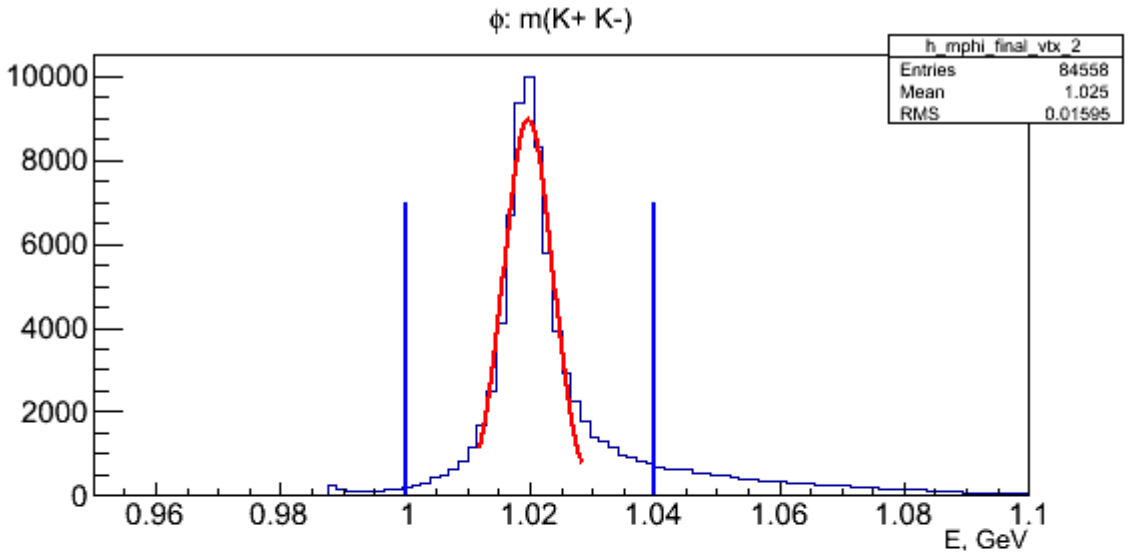
2. I also tried to perform a mass fitter for phi mass and here is the eta_c mass resolution after combining 2 phi after this fitter (PndKinFitter).

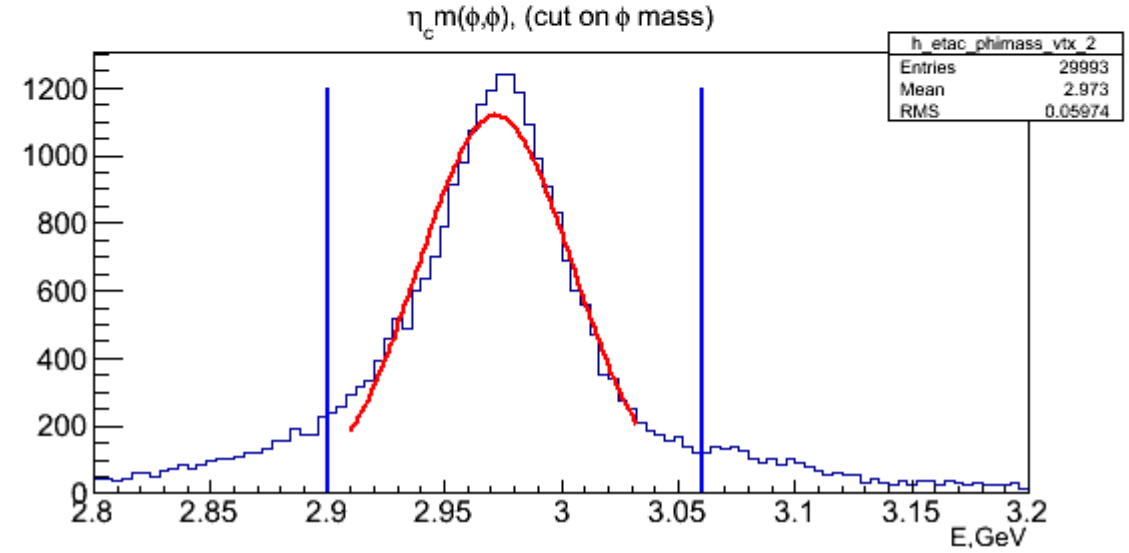
Here the best candidate is selected by difference between reconstructed and nominal eta_c mass and resolution is 34.7 MeV, i.e worse than with vertex fit. So I would exclude this option in eta_c analysis.

Dima

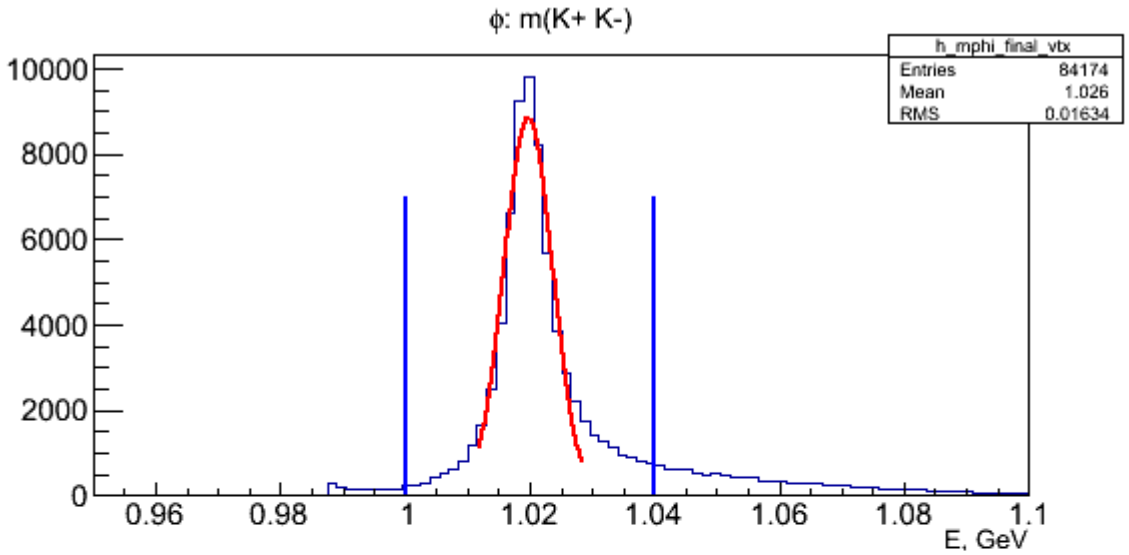
File Attachments

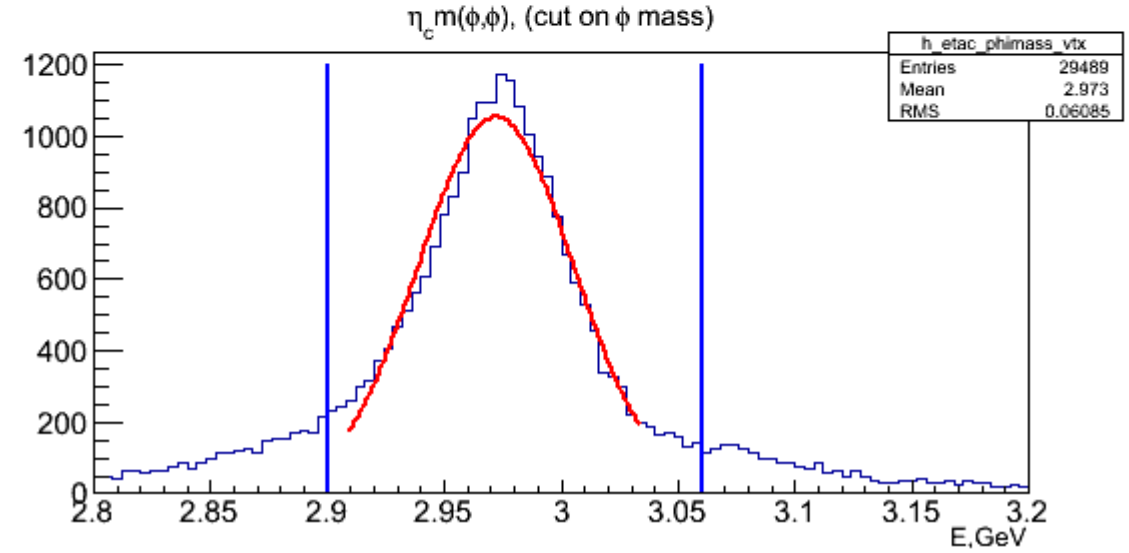
1) m_vertex_fit_preselection.png, downloaded 1342 times



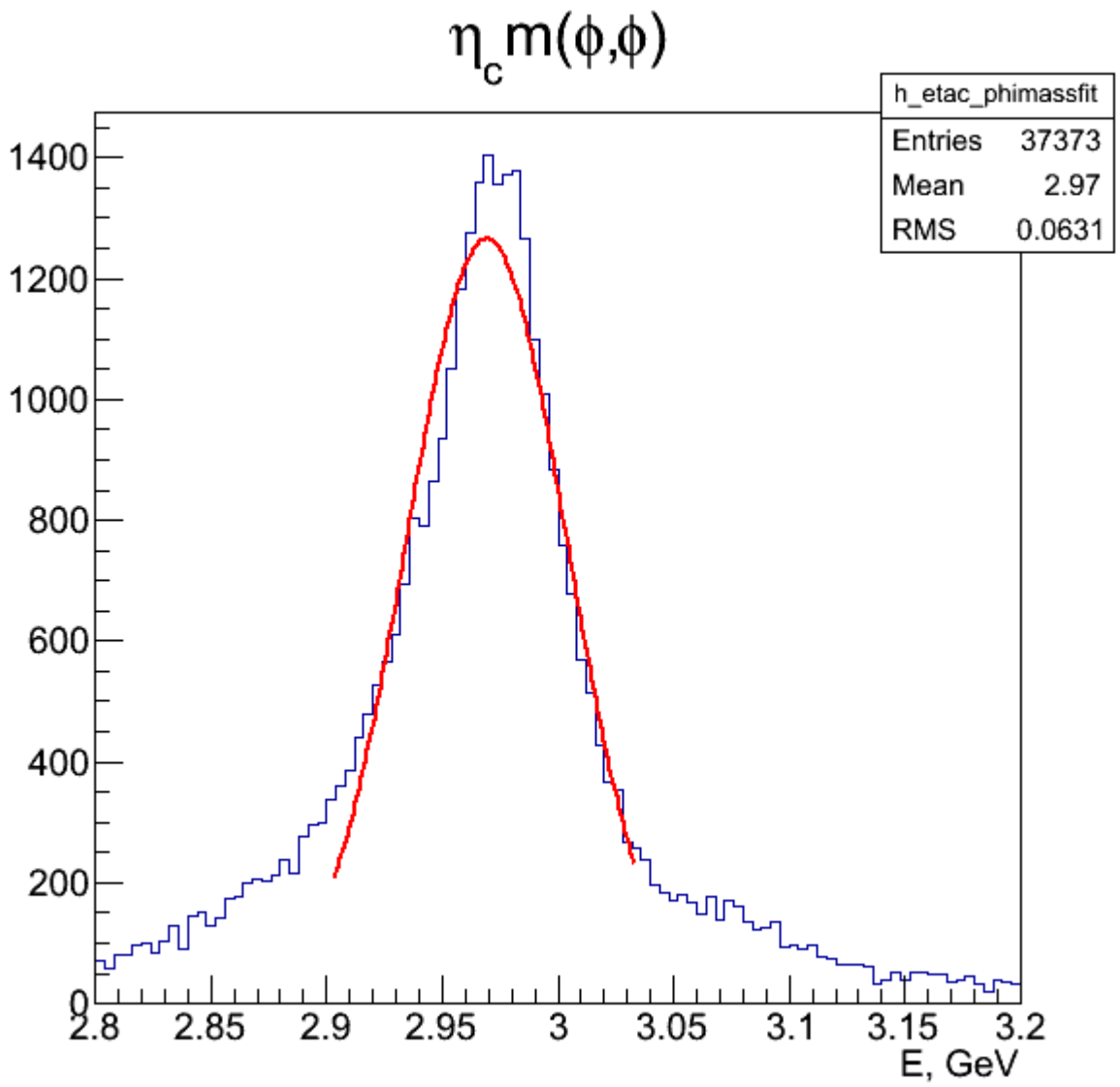


2) m_vertex_fit.png, downloaded 1354 times





3) m_mass_fit.png, downloaded 1347 times


$\eta_c m(\phi,\phi)$
h_etac_phimassfit
Entries 37373
Mean 2.97
RMS 0.0631
1400
1200
1000
800
600
400
200
0
2.8
2.85
2.9
2.95
3
3.05
3.1
3.15
3.2
E, GeV