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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 it 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

$$\frac{(\text{totalreco\_mass} - \text{etac\_mass})^2}{\sigma(\text{eta\_c})^2} + \frac{(\text{phi1reco\_mass} - \text{phimass})^2}{\sigma(\text{phi})} + \frac{(\text{phi2reco\_mass} - \text{phimass})^2}{\sigma(\text{phi})}$$

And here there is a small improvement in efficiency and eta\_c resolution and no improvement in phi mass resolution (efficiency 24.0%,  $\sigma(\text{eta\_c}) = 32.8$  MeV,  $\sigma(\text{phi}) = 3.92$  MeV).

For comparison with selection of best candidate after vertex fit (efficiency 22.8%,  $\sigma(\text{eta\_c}) = 33.2$  MeV,  $\sigma(\text{phi}) = 3.92$  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).

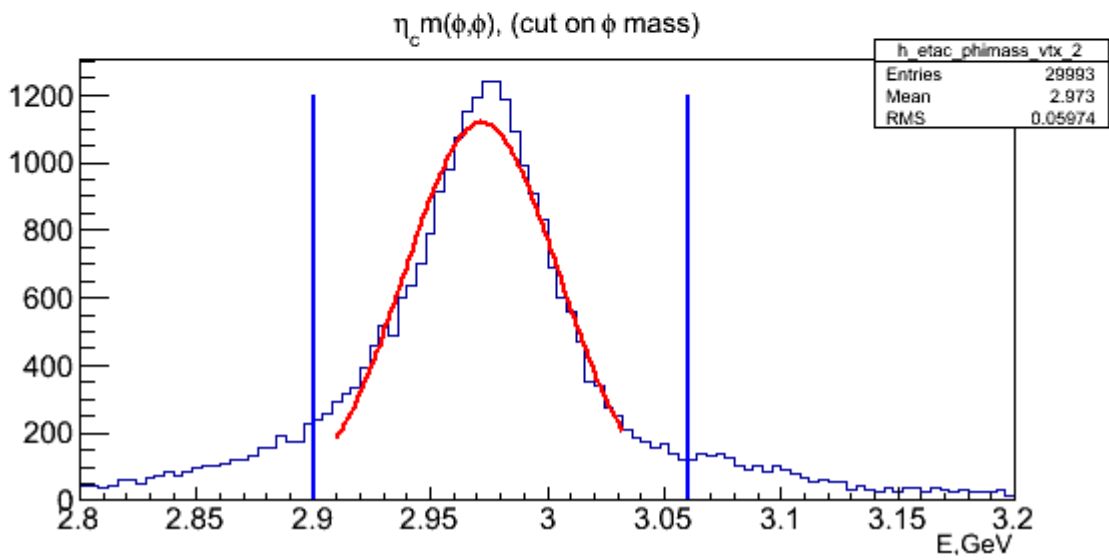
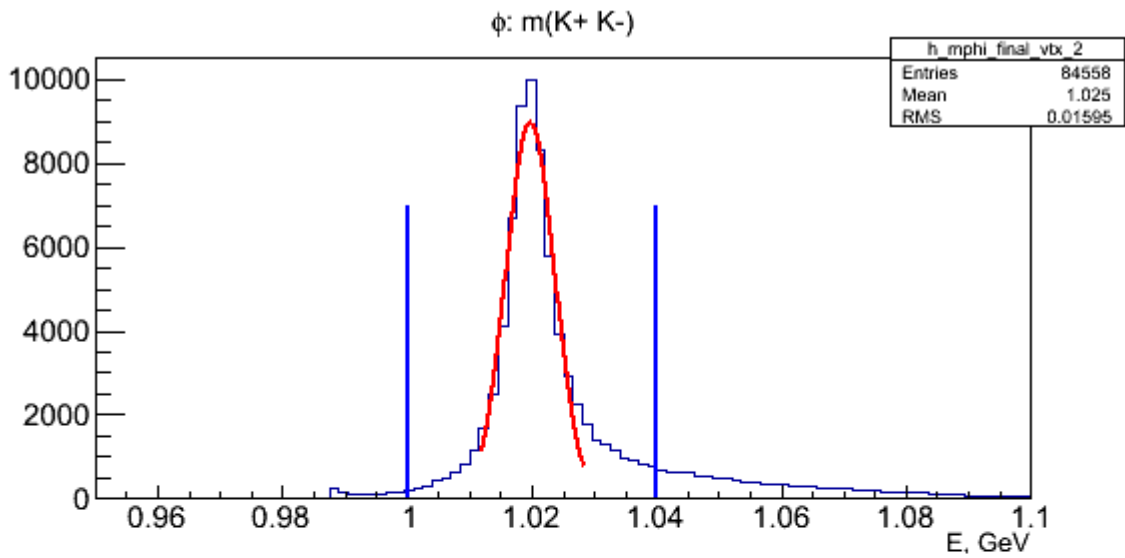
Here the best candidate is selected by difference between reconstructed and nominal eta\_c mass and resolution is 34.7 MeV, i.e. worse than with vertex fit. So I would exclude this option in eta\_c analysis.

Dima

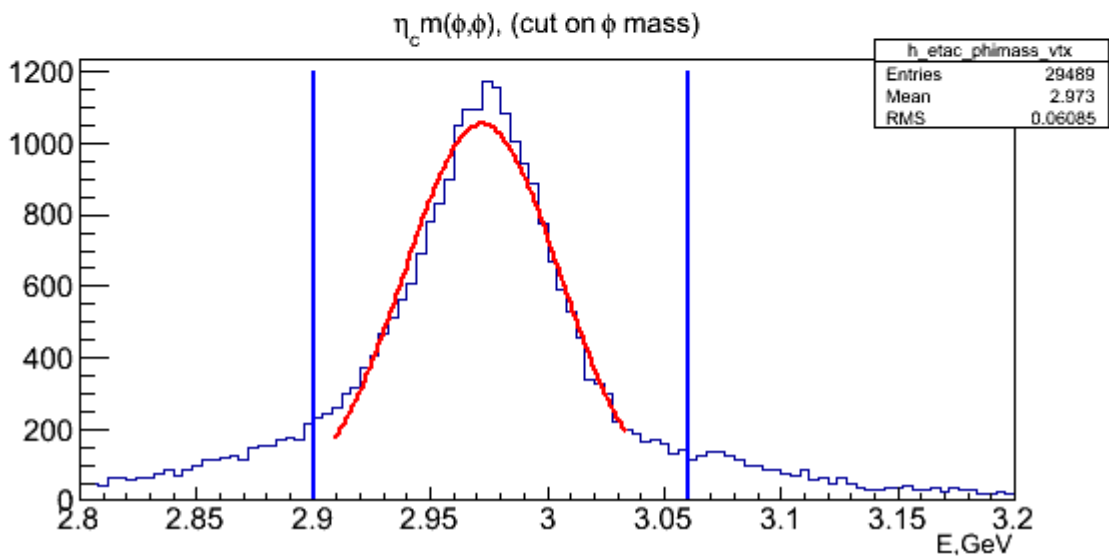
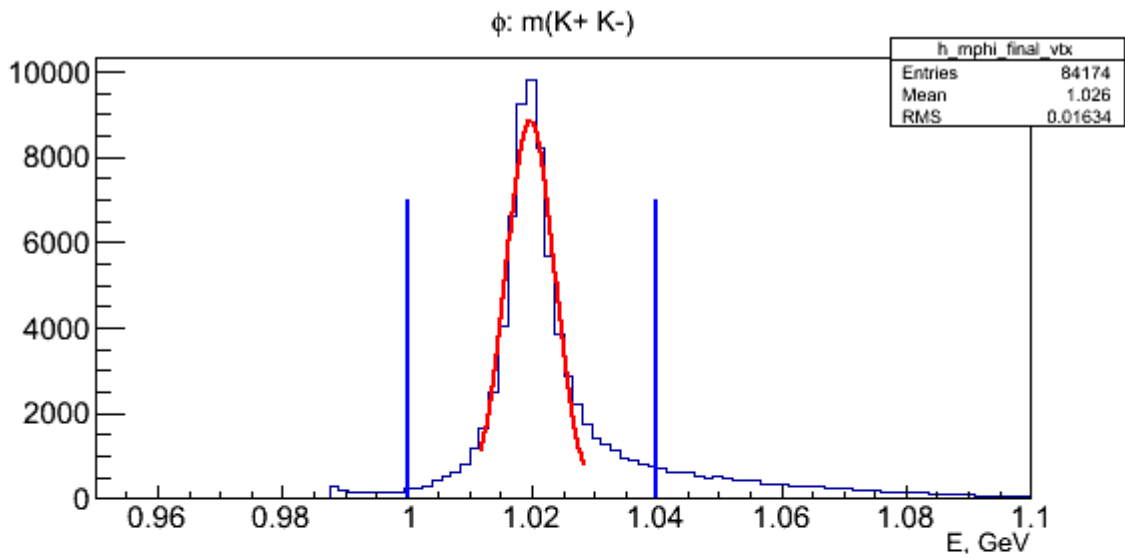
### File Attachments

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1) [m\\_vertex\\_fit\\_preselection.png](#), downloaded 1163 times



2) [m\\_vertex\\_fit.png](#), downloaded 1178 times



3) [m\\_mass\\_fit.png](#), downloaded 1146 times

$\eta_c m(\phi, \phi)$

