
Subject: Probability distribution of mass constraint fitting in oct14 vs. mar15

Posted by [Lu Cao](#) on Tue, 07 Jul 2015 13:25:13 GMT

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Dear all,

I simulated 2k evt of this decay chain:

$p\bar{b}arp \rightarrow Ds^+ Ds^-$; $Ds^- \rightarrow K^+ K^- \pi^-$; $Ds^+ \rightarrow \eta e^+ \nu_e$; $\eta \rightarrow \pi^+ \pi^- \pi^0$; $\pi^0 \rightarrow 2 \gamma$.

In order to reconstruct η , I do mass constraint fitting on $(\pi^+, \pi^- \pi^0)$ after the vtx fitting of combined charged daughters. Recently I find the probability distribution of the η mass constraint fitting seems incorrect, where most of prob are skewed to 1 and χ^2 is very small, i.e. the mean value of χ^2 is 0.0003. The interesting thing is this doesn't happen in the mass constraint fittings of Ds^- (pure charged daughters) and π^0 (pure neutral daughters). This problem is found with the release mar15 (#27529). I test the identical code with release oct14 (#26514), and find this problem doesn't arise there (see attached histograms). The code I used for testing is attached.

Question: Why it happens and how can I fix it?

Many thanks in advance.

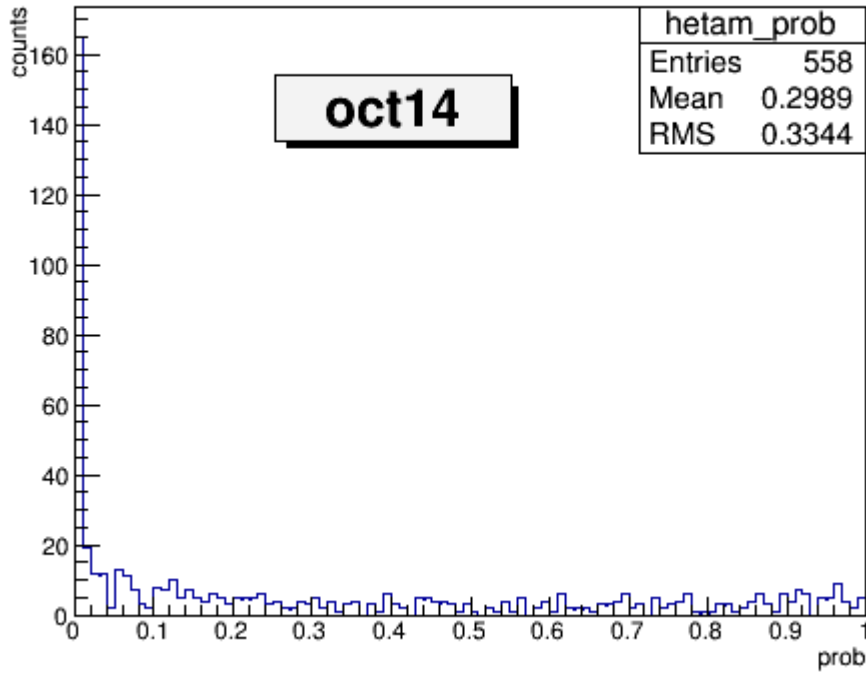
Best regards,

Lu

File Attachments

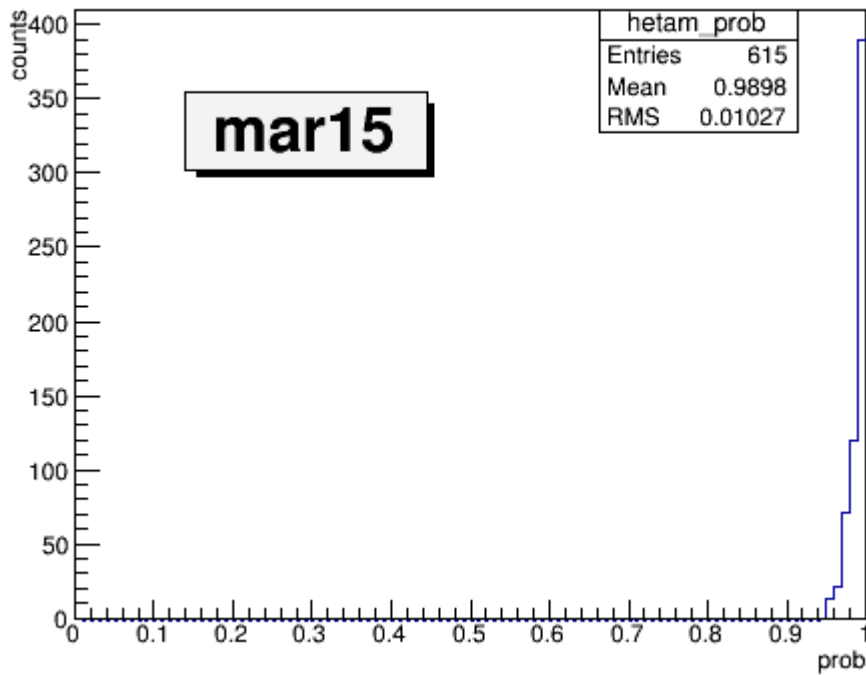
- 1) [dspair.dec](#), downloaded 455 times
- 2) [sim_complete.C](#), downloaded 435 times
- 3) [digi_complete.C](#), downloaded 383 times
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- 5) [pid_complete.C](#), downloaded 428 times
- 6) [oct14.png](#), downloaded 729 times

Chi2 probability distribution of η mass constraint fit



7) [mar15.png](#), downloaded 814 times

Chi2 probability distribution of η mass constraint fit



8) [up_mcf_neu_recon.C](#), downloaded 428 times
