Subject: PndVtxPRG vs PndKinVtxFitter
Posted by Karin Schönning on Fri, 24 Oct 2014 09:44:50 GMT
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Hi, after advice from Ralph and Stefano I ran some simulations of the pbar p -> Lambdabar Lambda at 4 GeV with ideal tracking (no Kalman filter) and compared the results for two different vertex fitters, PndVtxPRG and PndKinVtxFitter.

This part of my analysis macro look like:

```
for (j=0;j<lamb.GetLength();++j)
  {

    PndVtxPRG vtxfitterlb(lamb[j]);

   vtxfitterlb.Fit();
   double chi2_vtx = vtxfitterlb.GetChi2(); // access chi2 of fit
   double prob_vtx = vtxfitterlb.GetProb(); // access probability of fit
   h0b_chi2_vf->Fill(chi2_vtx);
   hlamb_prob_vf->Fill(prob_vtx);
    bool checkb=vtxfitterlb.Fit();
        if(checkb)
                                  // when good enough, fill some histos
   {

     RhoCandidate *lambv = lamb[j]->GetFit(); // access the fitted cand

.
.
.
.
```

and so on.

The PndKinVtxFitter gives slightly higher Lambda efficiency than PndVtxPRG.
Here are the results:

PndKinVtxFitter:

Lambda eff, no vertex fit: 15.2%
Lambda eff, vertex fit: 14.9%
Lambdabar eff, no vertex fit: 61.5%
Lambdabar eff, vertex fit: 59.2%
LLbar eff, vertex fit: 6.8%

PndVtxPRG:

Lambda eff, no vertex fit: 15.2%
Lambda eff, vertex fit: 11.0%
Lambdabar eff, no vertex fit: 61.5%
Lambdabar eff, vertex fit: 52.9%
LLbar eff, vertex fit: 5.5%

Unfortunatly, the results do not improve so much when running with half solenoid field. The lambda yield before vertex fit is larger but the lambdabar yield, and the yield after vertex fit, is worse than with the full field. I should mention that here, I don't cut on the mass at all.

PndKinVtxFitter, half solenoid field:

Lambda eff, no vertex fit: 18.4%
Lambda eff, vertex fit: 10.3%
Lambdabar eff, no vertex fit: 54.9%
Lambdabar eff, vertex fit: 39.2%
LLbar eff, vertex fit: 5.6%

PndVtxPRG, half solenoid field:

Lambda eff, no vertex fit: 18.4%
Lambda eff, vertex fit: 10.0%
Lambdabar eff, no vertex fit: 54.9%
Lambdabar eff, vertex fit: 36.8%
LLbar eff, vertex fit: 5.2%

I would still expect a larger improvement when running with half field so I don't understand this.

/Karin