
Subject: Pnd4CFitter - how to use it

Posted by [Elisabetta Prencipe \(2\)](#) on Fri, 30 Aug 2013 13:03:25 GMT

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Dear Rho experts,

I am reconstructing the meson $D_s(2536)^+$ through its decay to $D^*0 K^+$, D^*0 to $D0$ gamma, $D0$ to $K\text{-}\pi^+$.

With the vertex fit or the mass constrained fit, no problems...I mean, I get troubles with the reconstruction of neutrals such as gammas, but this is another topic. My question now is the following: I have my D_s2535 list, and I write:

```
for (j=0;j<Ds2535.GetLength();++j)
{
  Pnd4CFitter fitter(Ds2535[j],ini);
  fitter.FitConserveMasses();
  double chi2_4c=fitter.GetChi2();
  hm_chi2_4c->Fill(chi2_4c);

  if (chi2_4c<40)
  {
    RhoCandidate *jfit = Ds2535[j]->GetFit();
    RhoCandidate *jfit2=Ds2535[j]->Daughter(0)->GetFit();

    h_4cf->Fill(jfit->M());
    h_4cf2->Fill(jfit2->M());

  }
}
```

The histograms are filled, but with crazy results. What am I doing so wrong? thank you for any feedback!
Elisabetta

Subject: Re: Pnd4CFitter - how to use it

Posted by [Stefano Spataro](#) on Fri, 30 Aug 2013 13:40:58 GMT

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The 4-constraints fit forces the final 4-momentum, sum of the decay products, to be exactly like the initial one.

If you have a formation experiment, i.e. $p\text{bar}p \rightarrow h_c$, then you can use the 4C fitter since you know the p at rest and the projectile $p\text{bar}$, but if you have a reaction like $p\text{bar}p \rightarrow DD$ you cannot use it to force the mass of one single D , since you don't know its initial 4-momentum. You can force the DD state, but not the single D .

I suppose this is the reason why it does not work in your case.

Subject: Re: Pnd4CFitter - how to use it
Posted by [Klaus Götzen](#) on Fri, 30 Aug 2013 13:45:38 GMT
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Hi Elisabetta,

could you try to use the PndKinFitter instead and compare? It works like this:

```
PndKinFitter fitter(Ds2535[j]);  
fitter.Add4MomConstraint(ini);  
fitter.Fit();
```

```
double chi2_4c = fitter.GetChi2();  
double prob_4c = fitter.GetProb();
```

```
if ( prob_4c > 0.01 )  
{  
    RhoCandidate *dstarfit = Ds2535[j]->Daughter(0)->GetFit();  
    ...  
}
```

Best,
Klaus
