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Subject: Different x-y resolutions

Posted by [Simone Bianco](#) on Tue, 19 Jul 2011 11:16:58 GMT

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Dear Tracking experts,

I am simulating simple events with 4 pions (2pi+ and 2 pi-) with a momentum of 1GeV/c, which are propagated from (0,0,0). I am generating these particles with an homogeneous distribution in phi and in theta (where theta is restricted to the range [20,140]°).

The simulations are performed with all the detectors in, but I set as active only the MVD, the Stt, the GEMs and the forward tracer.

I perform my reconstruction using:

PndMvdRiemannTrackFinderTask, PndSttTrackFinderReal, PndSttMvdTracking, Pnd RecoKalmanTask, PndMCTrackAssociator, PndPidCorrelator (with pion hypothesis), PndPidIdealAssociatorTask.

At the end of this chain I am running some analysis using the PndVtxPoca vertex finder.

I fill histograms with the three components of the reconstructed vertices. As you can see in the attached figures I get a significantly different sigmas for x and y.

X always looks worse (even with different momenta and theta ranges).

I have already tried with different topologies like using two particles instead of four, or using pions of the same charge, but I always get worse results for X.

I tried with different vertexing tools (POCA, Ralf's fast fitter, another implementation of the POCA) and I always noticed this behaviour. It really seems to come from previous steps since if I try to rotate of 90° the tracks just before running the POCA vertex finder I obtain symmetrical results (worse Y than X, see the second figure attached).

Does any of you have an idea about possible reasons of this effect?

Thanks in advance.

Cheers,

Simone

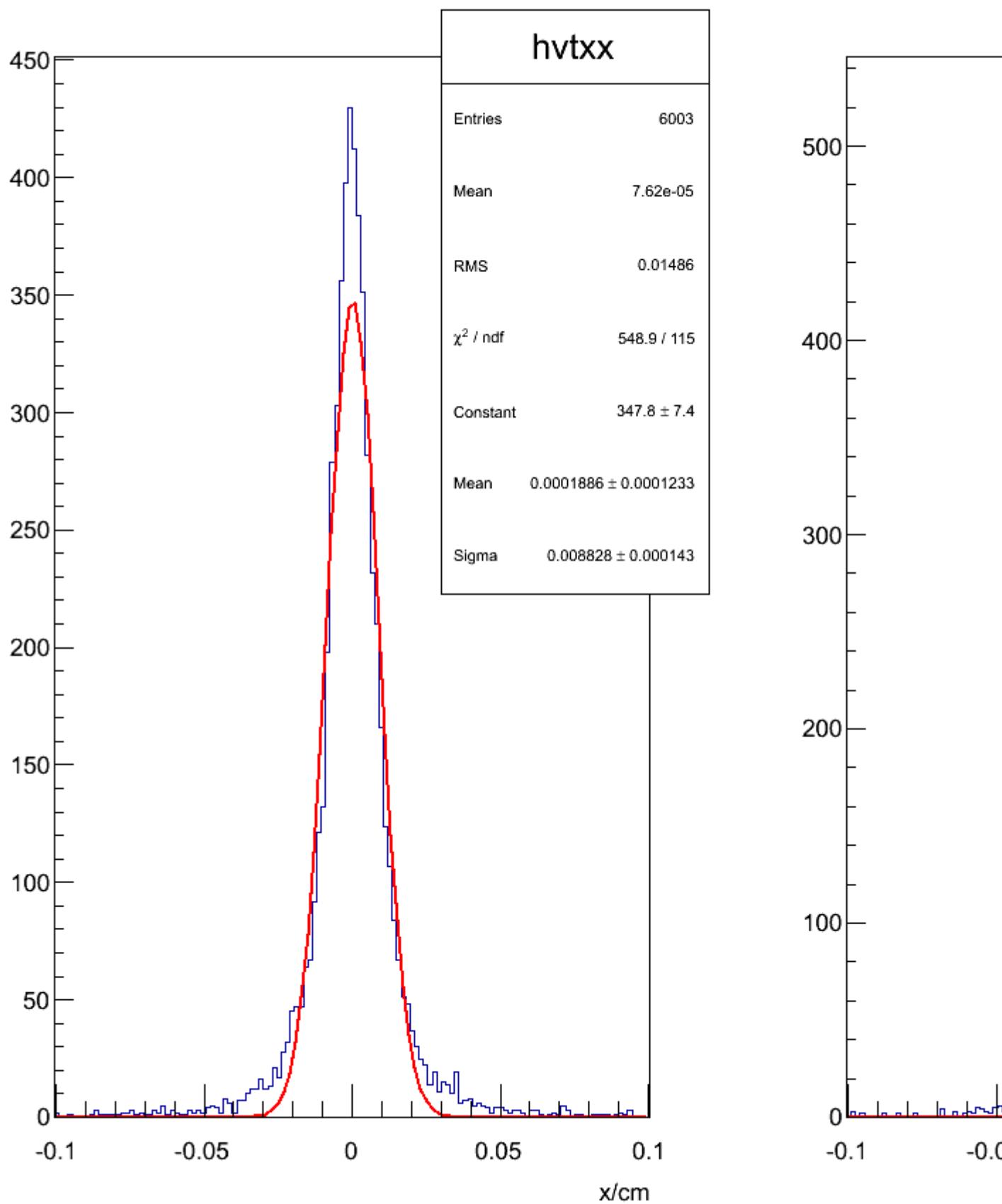
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#### File Attachments

1) [Vtx-0-0-0-1GeV-4Pions.png](#), downloaded 1151 times

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# Vertex



2) [Rotation-Vtx-0-0-0-1GeV-4Pions.png](#), downloaded 1101 times

## Vertex

