Subject: Tracking with different particle hypothesis
Posted by StefanoSpataro on Tue, 08 Mar 2011 16:10:12 GMT
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Dear all,
I have done a test trying to check tracking performances for different particle hypothesis.
I run 10k events for each particle kind, e mu pi k p, box generator from 0.15 to 3 GeV/c with lhe+kalman.

The following plot show deltap/p versus p for different particle species. The first row is using the default muon hypothesis in the kalman, the second row is using the correct particle hypothesis:

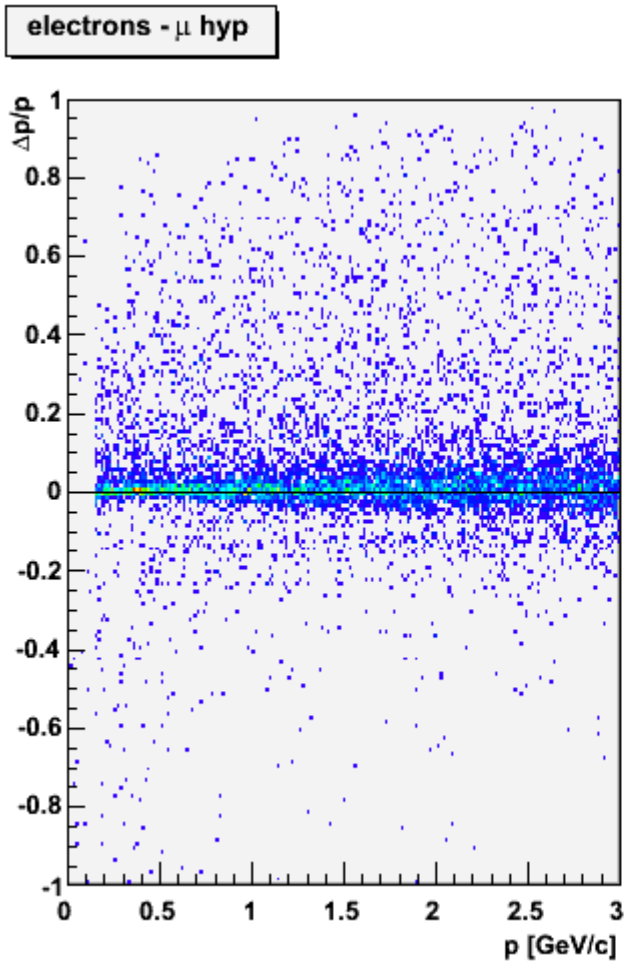
Muons: nothing to declare
Pions: no big differences as we suspect
Kaons: muon hyp introduces systematics for p < 500 MeV/c, which is fixed using the correct hyp
Protons: even here the systematic is clear, even at a bit larger momenta. The correct particle hyp seems to fix it, but there is still some noise at very low momenta
Electrons: the electron hypothesis makes things worse, here at present we have to use muon hyp to have a better momentum resolution

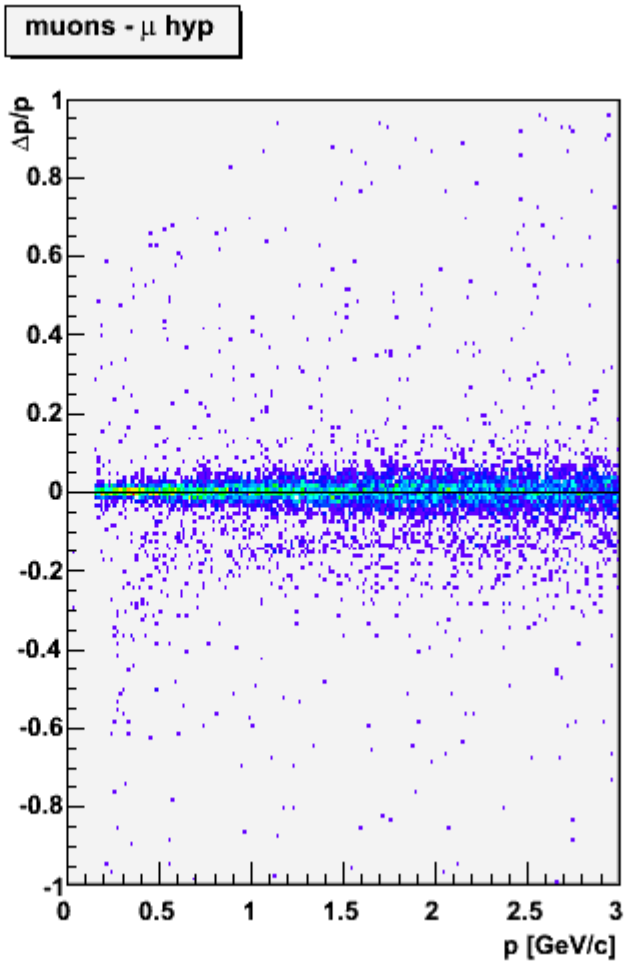
After these plots, maybe we could start to think about running only muon hypothesis for p>1 GeV/c, and muon+kaon+proton hypothesis for p<1 GeV/c, to improve the performances.

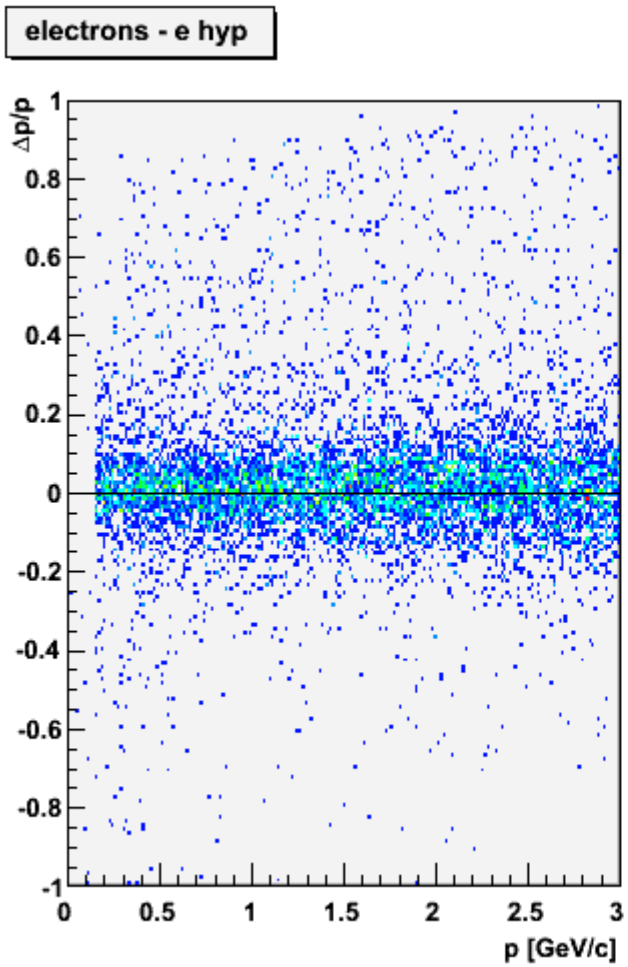
This plot is only to give an idea on what is happening, of course dedicated studies are needed, theta and chi2 should be also checked, and probably the electron reconstruction needs an improvement.

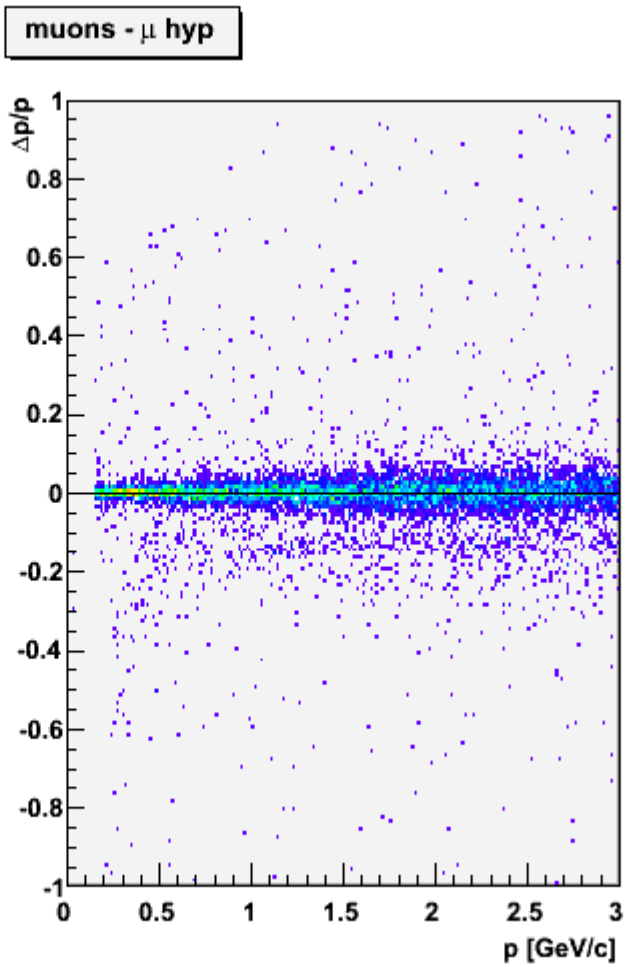
File Attachments

1) tpc_multihyp_6.gif, downloaded 1494 times


electrons - μ hyp
Δp/p
p [GeV/c]


muons - μ hyp
Δp/p
p [GeV/c]


electrons - e hyp
Δp/p
p [GeV/c]


muons - μ hyp
Δp/p
p [GeV/c]

Subject: Re: Tracking with different particle hypothesis
Posted by Jens Sören Lange on Tue, 08 Mar 2011 16:57:16 GMT
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Hi Stefano,

Quote: * Electrons: the electron hypothesis makes things worse, here at present we have to use muon hyp to have a better momentum resolution

I was under the impression that it was proven by Lia that the Urban model in Geane may be responsible for the problems with the electron hypothesis
(at least she reported that the reconstructed momentum becomes almost as good as for the muon hypothesis after switch off).

http://forum.gsi.de/index.php?t=tree&th=3009&start=0&rid=0&S=12bb7c6af69795d10b7272eaefaad03f#page_top

click on Lia's reply Thu, 23 December 2010 21:54

cheers, Soeren