Subject: Re: GEM tracking
Posted by Radoslaw Karabowicz on Thu, 25 Jun 2009 14:22:17 GMT
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Happy news finally!

During the Panda Torino meeting we sat together with Christian and looked at the GEM track fitting. After several hours we pinned down the problem and realized that the GEANE was not aware of having any magnetic field at all.
We found out that in the GEM MC simulation macro the magnetic field was not put into the par.root file. To be more precise, the following lines were missing:

```
 PndMultiFieldPar* fieldPar =
    (PndMultiFieldPar*) rtdb->getContainer("PndMultiFieldPar");
  if(fField)  {  fieldPar->SetParameters(fField); }
  fieldPar->setInputVersion(fRun->GetRunId(),1);
  fieldPar->setChanged(kTRUE);
```

Also in the reconstruction macro, the magnetic field was not sent to the Geane. After adding line:

```
  Geane->SetField(fRun->GetField());
```

the tracking now performs perfect.

I have again shot 1000 pions with momentum 2GeV/c, at some theta and phi angles. I have used the distribution of the fitted tracks' momenta to draw the mean reconstructed momentum as function of theta and phi. The resulting plot is here:

The fitted momenta are very close to 2.0 GeV/c which was the MC momentum and much lower than the initial GENFIT momentum, which was set to 2.1GeV/c.

I have also constructed similar map, but this time with the width of gaussian fits to the reconstructed momentum distribution:

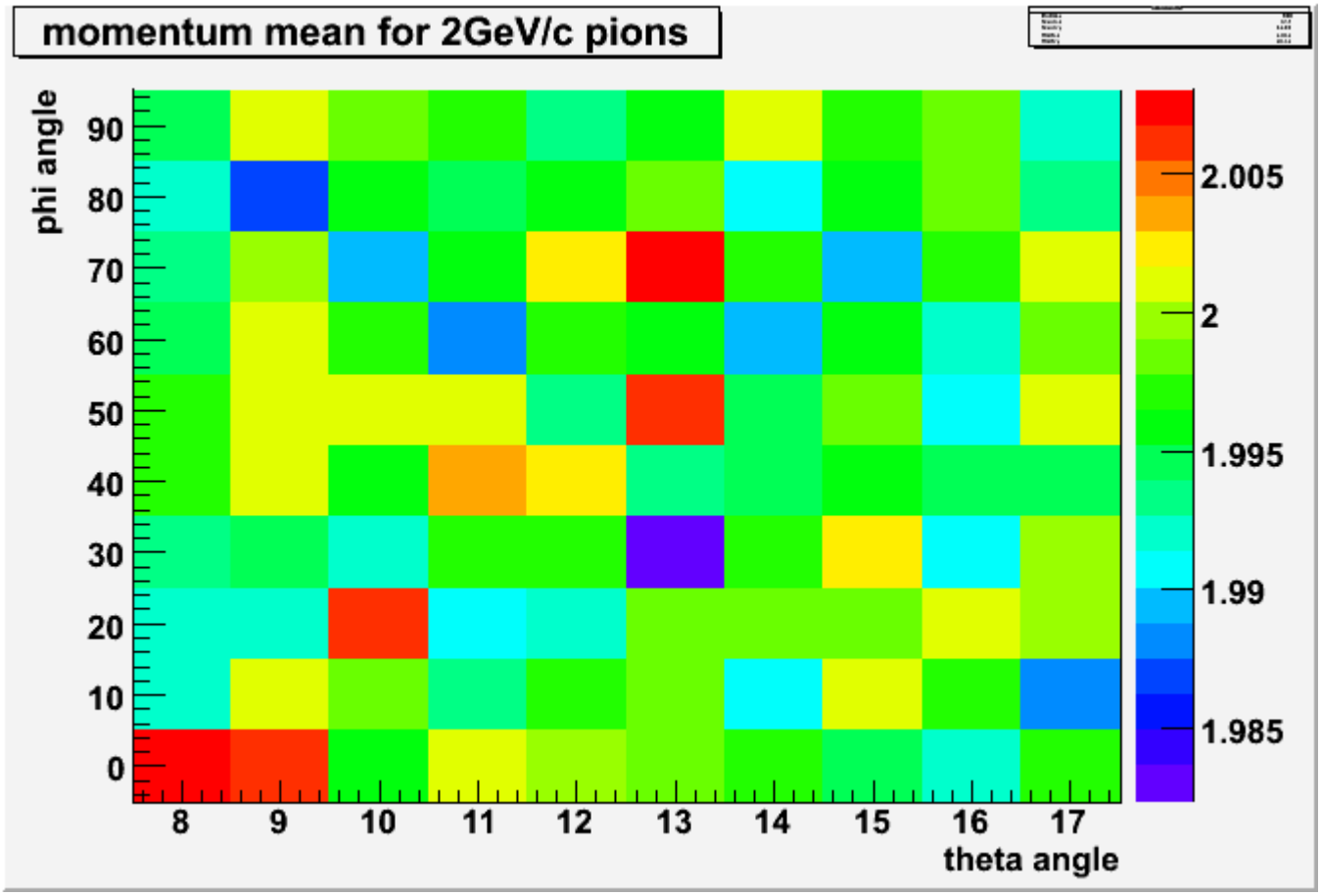
From the plot you can deduce that the larger the emission theta angle the better the momentum resolution. This is understood, since it also means the bigger curvature in the magnetic field. To put some numbers, it looks that momentum resolution varies between 4% and 8% depending on the theta emission angle.

More studies to come, but I would like to send special thanks to Ola W., Christian and Stefano, who particularly helped me to get the results.

yours,
radek

File Attachments

1) mom_mean.gif, downloaded 683 times



2) mom_sigma.gif, downloaded 746 times