Subject: GEM Tracking inside LHETRACK
Posted by StefanoSpataro on Mon, 22 Jun 2009 20:20:35 GMT
View Forum Message <> Reply to Message

Dear all,
under Ralf's suggestion I have extended the lhetrack code in order to be able to use even GEM hits.
The code is inside svn and it seems to work.

I have simulated 500 muons at 2GeV/c, from 5° to 20°, using tpc + mvd + 3 stations of gem detector.

I plot the momentum distribution for tracks reconstructed by lhetrack, with and without gems, and also after genfit.

You can see the blue lines coming from MVD+TPC tacking, without GEMs.
Once I add even GEMs to the tracking, with only lhetrack fit (which means helix fit) I can see a peak but not at the correct position (dashed red line). Once I give my hits to genfit, the peak (continuous red line) goes to the proper position, and the improvement is quite evident with respect to the blu line (without GEMs).
In case of MVD+TPC+GEM genfit, the resolution at 2GeV/s seems something like 1.2%.

I would suppose that there is a lot of space for improvements (i.e. ideal tracking does not work yet for gems, and it is not so clear to me why I have an average GEM hit multiplicity at 7), and that the code should be checked for different momentum ranges and also for STT (volunteers are kindly requested), but I think this is a good starting point.

If you want to try, I have put inside tutorials/lhetrack the following macros:

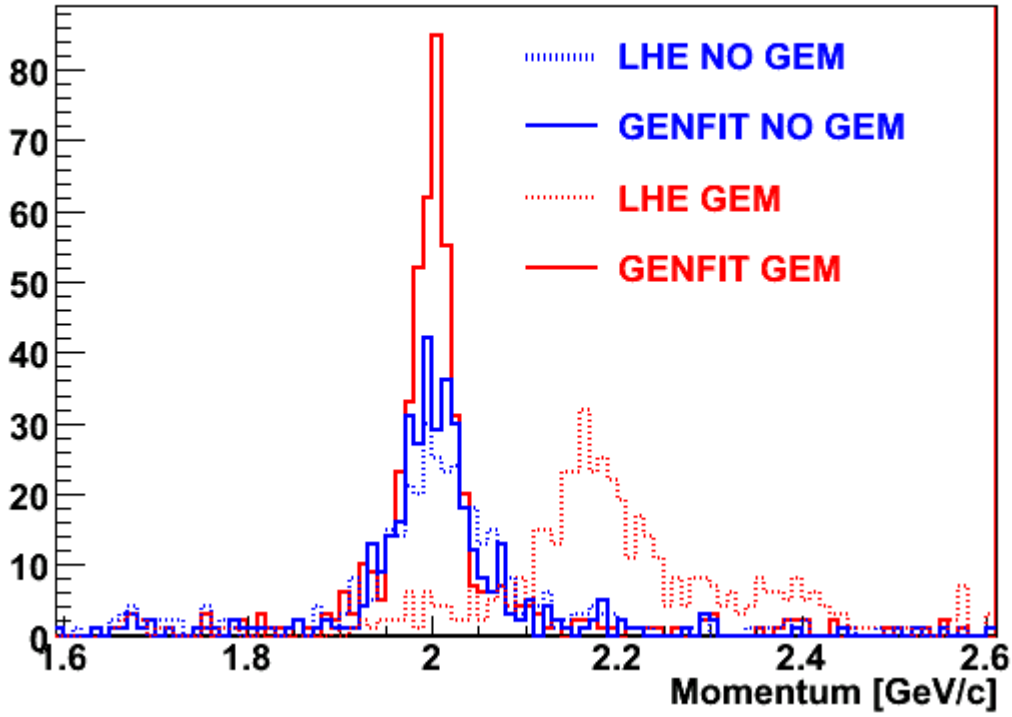
run_sim_tpccombigem_pgun.C
run_digi_tpccombigem.C
run_reco_tpccombigem.C

(the standard run_kalman_tpc.C is working without any changes).

Feedback and comments are welcome.

File Attachments

1) gem_tracking.gif, downloaded 857 times


LHE NO GEM
GENFIT NO GEM
LHE GEM
GENFIT GEM
80
70
60
50
40
30
20
10
0
1.6
1.8
2
2.2
2.4
2.6
Momentum [GeV/c]