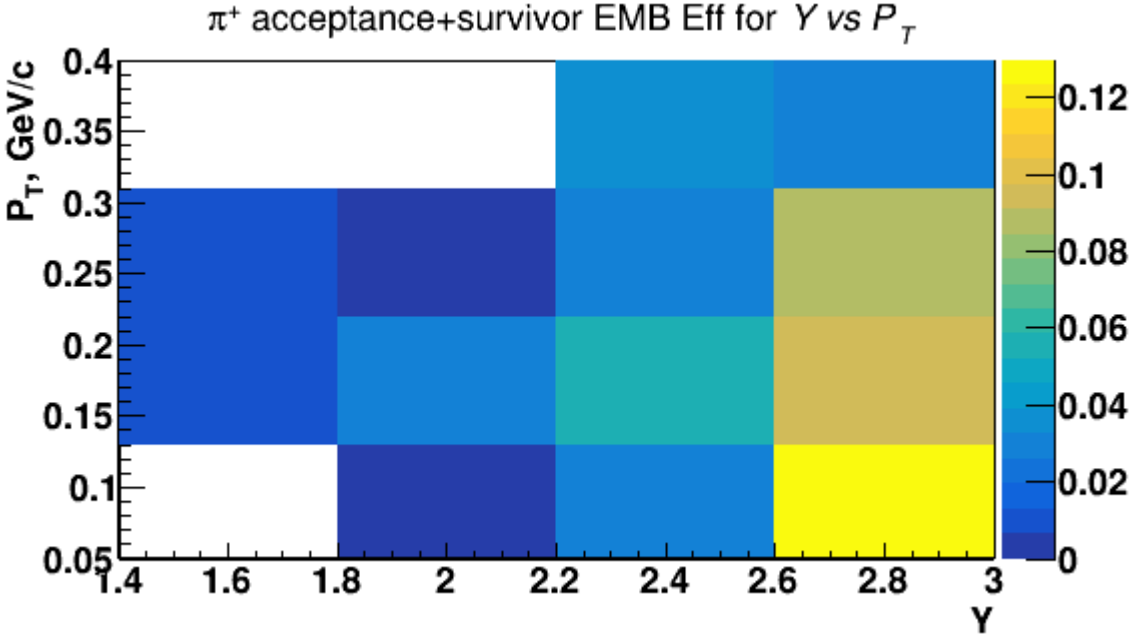
Status of Embedding

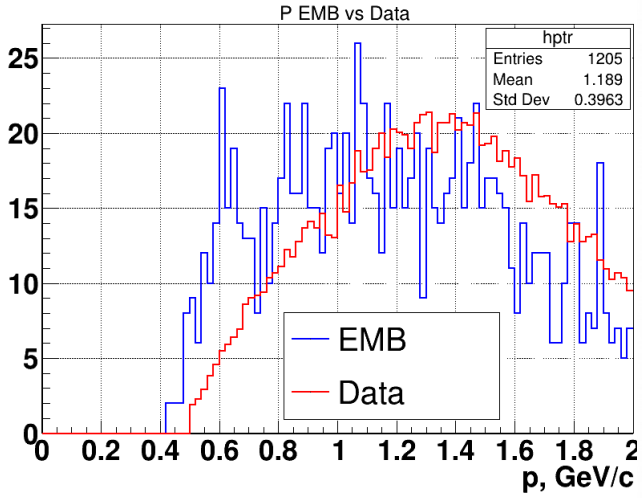
- Efficiency of embedding in (Y,Pt) bins
- P, Y, Pt spectra of identified π^+ after embedding
- P, Y spectra of identified π^+ in MC with detectors efficiencies (recap)
- Possible ways to match MC to the Data
- Detailed GEM geometry from Dmitriy
- Using of another MC generator
- Matching MC residuals for Si/GEM/CSC/TOF400 to the Data
- $N_{\pi+}$ in the Data vs magnetic field shift by Z axis

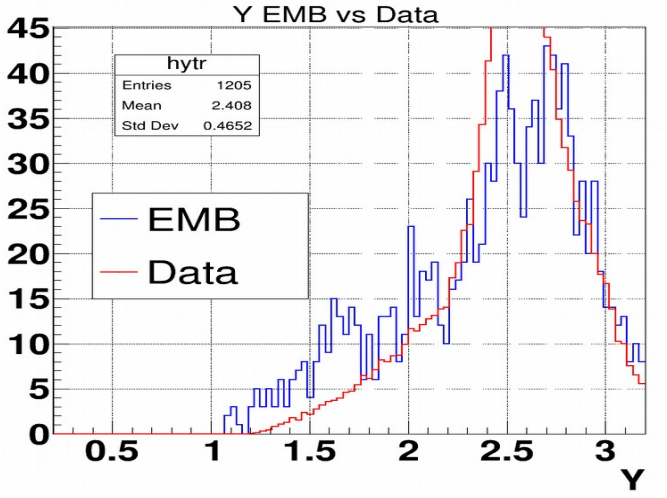
Efficiency of embedding in (Y,Pt) bins

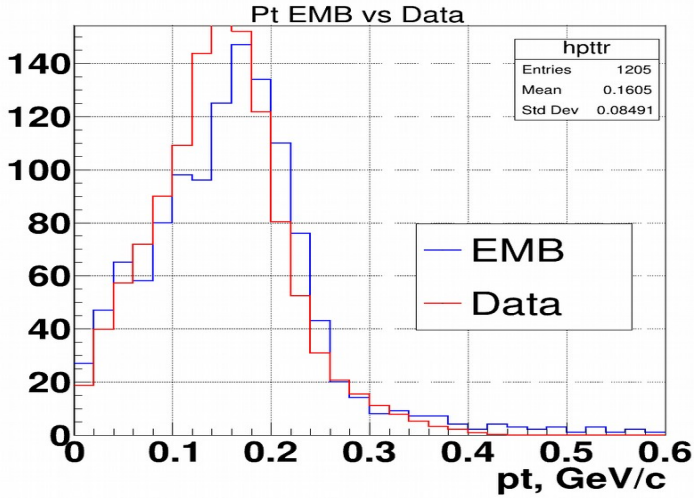


- Detectors efficiencies are implemented to the embedding
- One step approach is implemented to calculate Eff_{EMB}
- (Gleb used two steps approach, $Eff_{EMB}=Eff_{Accept\_MC\_reco}*Eff_{EMB\_MC\_reco}$)
- For now we filter tracks to embedding by "at least 5 StsPoints of MCTrack in acceptance" criteria

P, Y, Pt spectra of identified π^+ after embedding

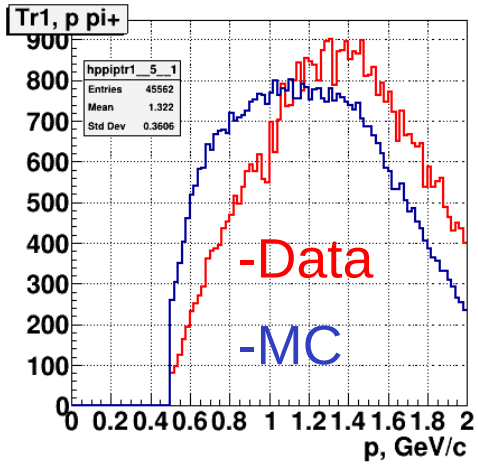


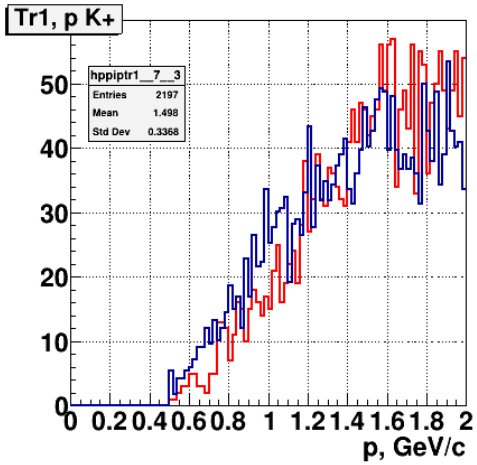


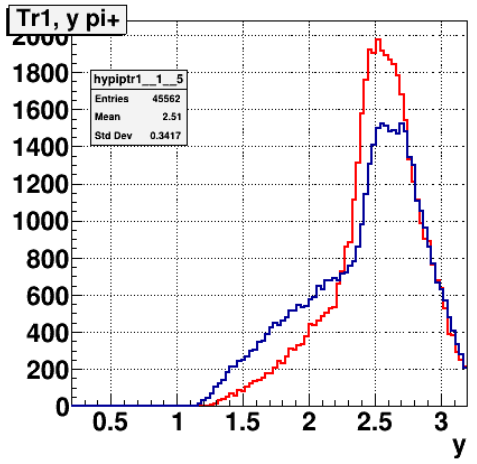


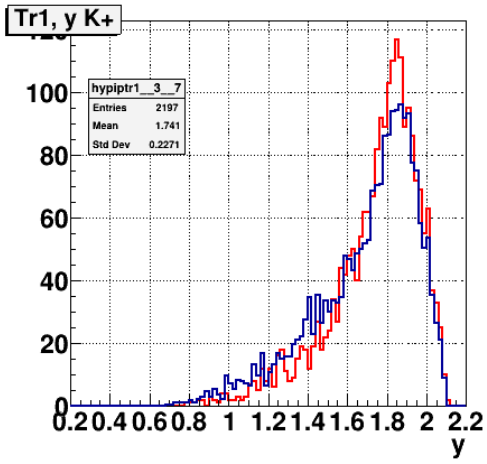
- π^+ P and Y spectra after embedding are softer than for Data (the same as for MC)
- One MC run (50K events) and one Data run are used to embedding

P, Y spectra of identified π^+ in MC with detector efficiencies (recap)







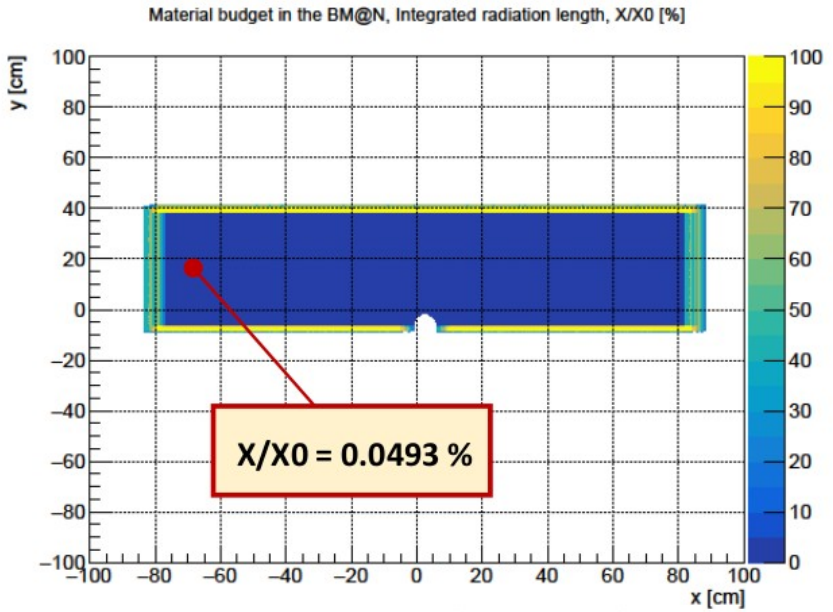


- All spectra are normalized to the integral
- P and Y spectra of K^+ for Data and MC close to each other
- P and Y spectra of π^+ for Data and MC significantly different

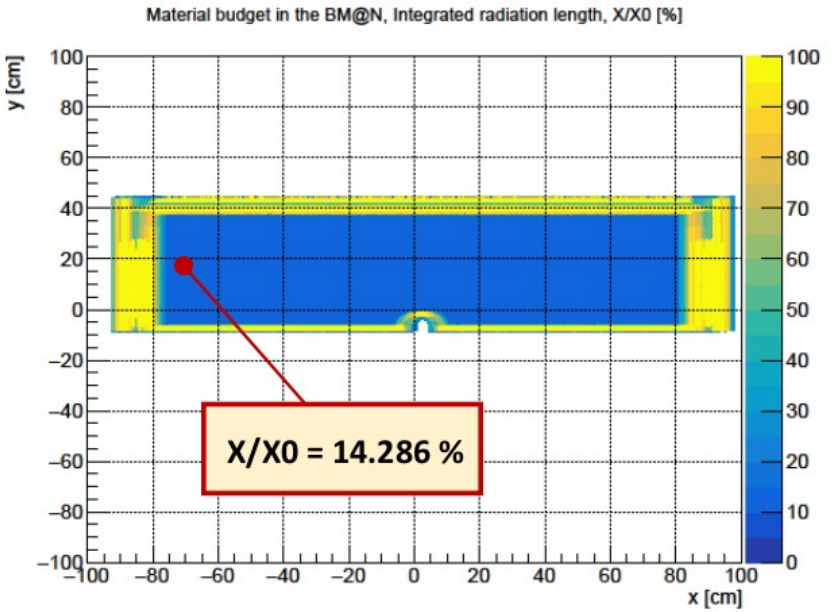
Possible ways to match MC to the Data

- To implement Detailed GEM geometry from Dmitriy
- To use of another MC generator (QGSM for example)
- To match of MC residuals for Si/GEM/CSC/TOF400 to the Data

Detailed GEM geometry from Dmitriy



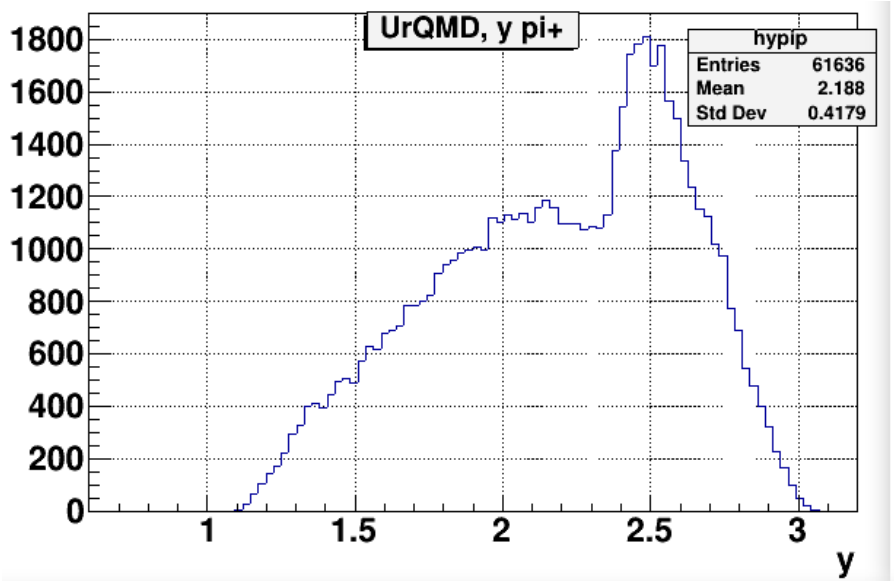
Material budget of six stations for tracks parallel to Z axis (simplified geometry)

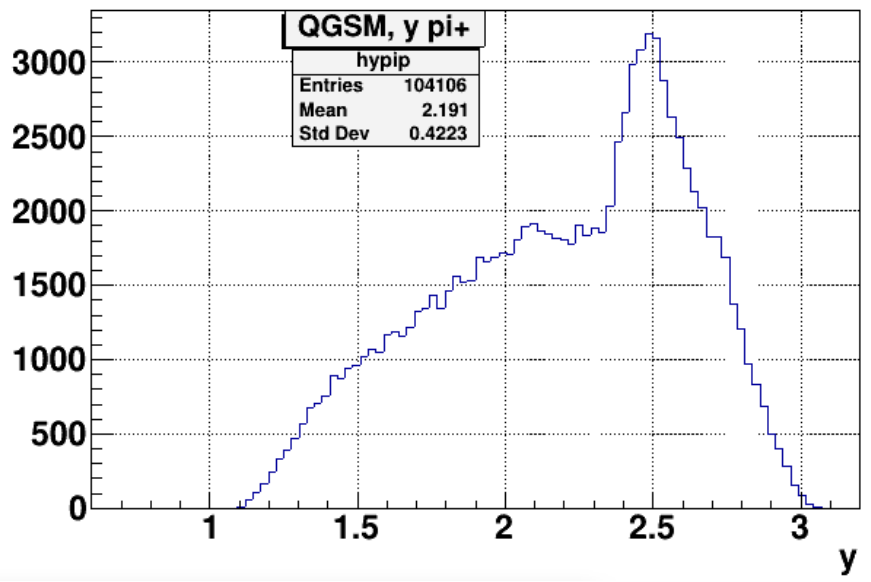


Material budget of six stations for tracks parallel to Z axis (detailed geometry)

- Left plot – current geometry, right plot – new geometry
- New geometry gives additional background (embedding is aimed to solve it) and prevents π^+ from passing through identification detectors (there in no strong energy dependence for that in BM@N detection region)

Using of another MC generator



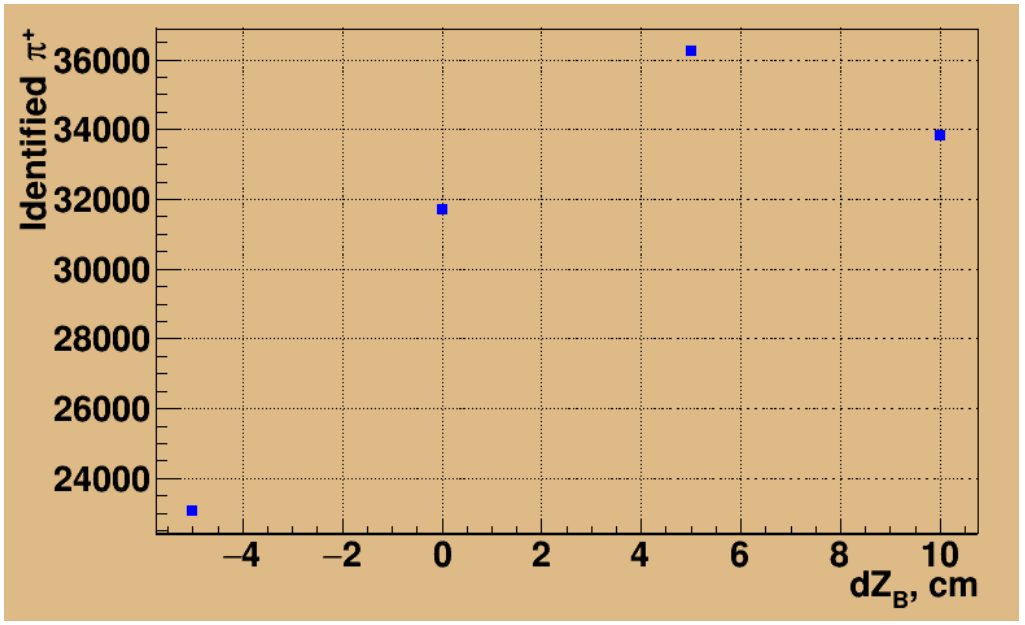


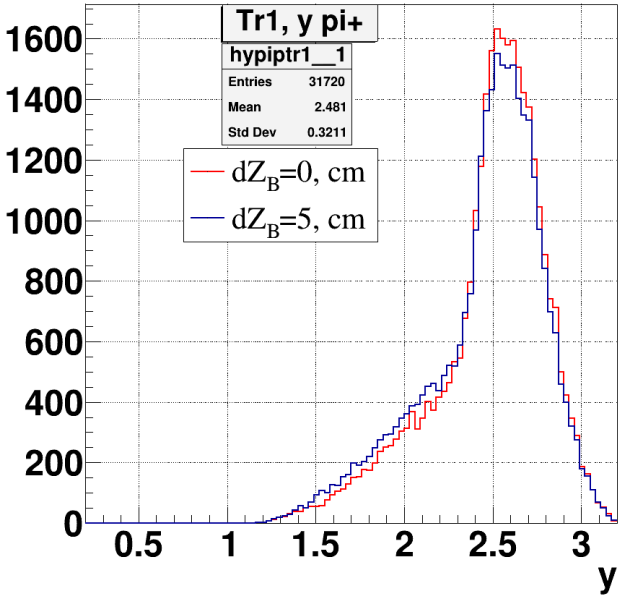
- Left plot – UrQMD, right plot – QGSM (the same old identification chain for both)
- Both spectra are close to each other (the difference less than 20%)
- So QGSM may not reduce the existing difference

Matching MC residuals for Si/GEM/CSC/TOF400 to the Data

- Before the realistic Lorenz Shifts implementation to the MC, GEM dX_{MC} was 1.5-2 times less than dX_{Data}
- After Lorenz Shifts implementation we did not check it
- We also need to match the residuals of MC CSC and TOF400 with the data

$N_{\pi+}$ in the Data vs magnetic field shift by Z axis





- Maximum of identified π^+ is obtained for magnetic field shift by Z axis on +5 cm (~15% excess than for dZ_B=0 cm)
- For dZ_B=5 cm Y spectrum becomes a little bit softer