

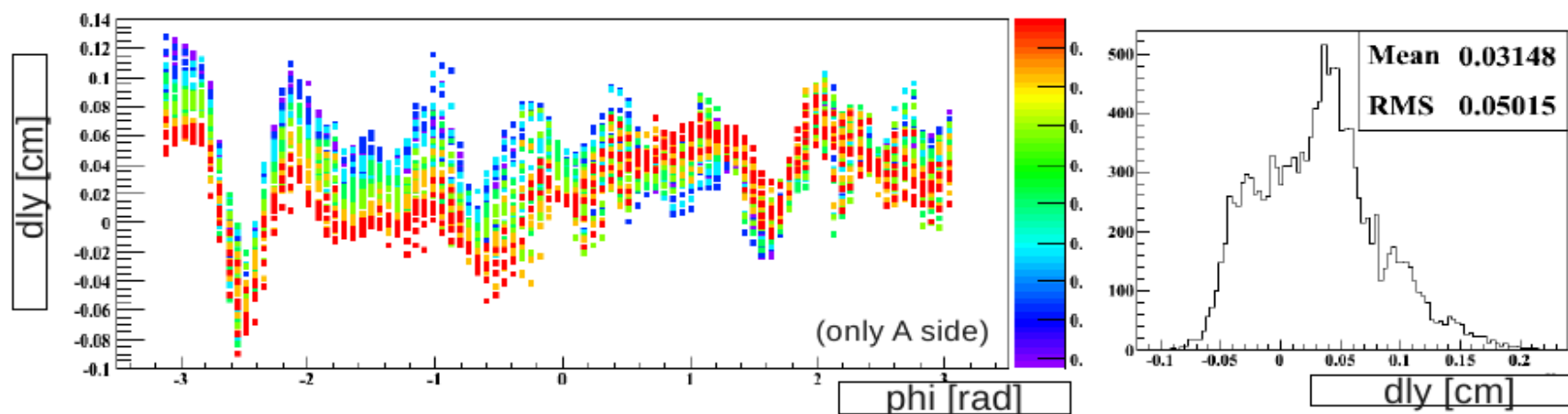
E field distortions

E field distortions

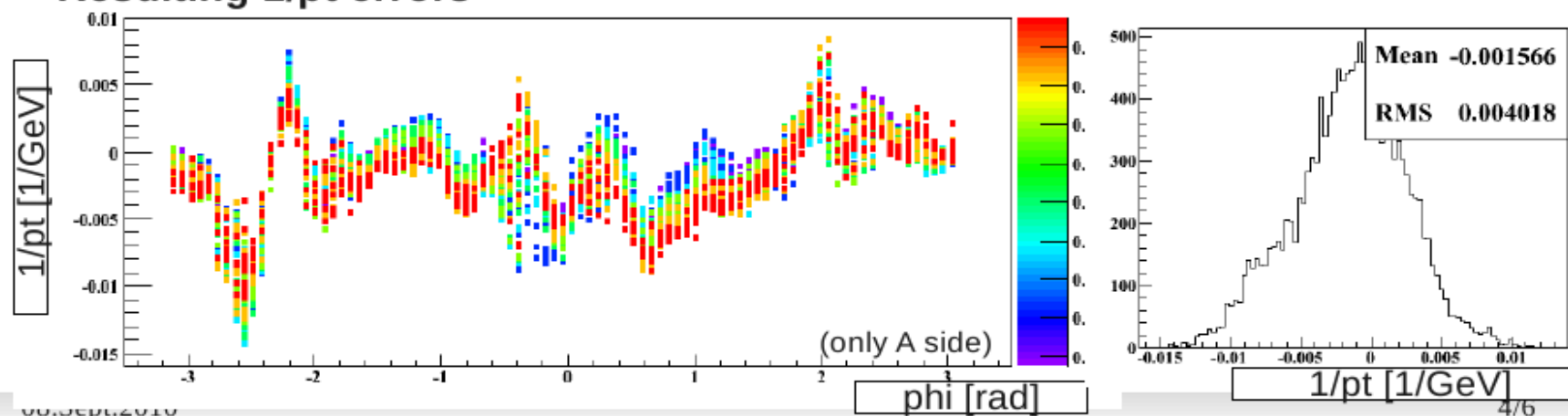
- The main **remaining** source of space points distortion due E field distortion (mechanical tolerances)
 - Effect 5 mm close to the Inner Field Cage and ~ 1.5 mm close to the Outer Field Cage
- In the previous reconstruction passes correction using 2 lookup tables were applied
 - Drawback – independent lookup tables for R and $R \times \theta$ distortion were used (R distortions calibration problematic)
 - Residual distortions RMS ~0.5 mm – TPC-ITS matching
- New approach – Physical model - E field calculation – fitting parameters of e.g. Rod misalignment

Current PASS-2 status

Remaining residual on the TPC-ITS matching : Δly (below) and Δsnp



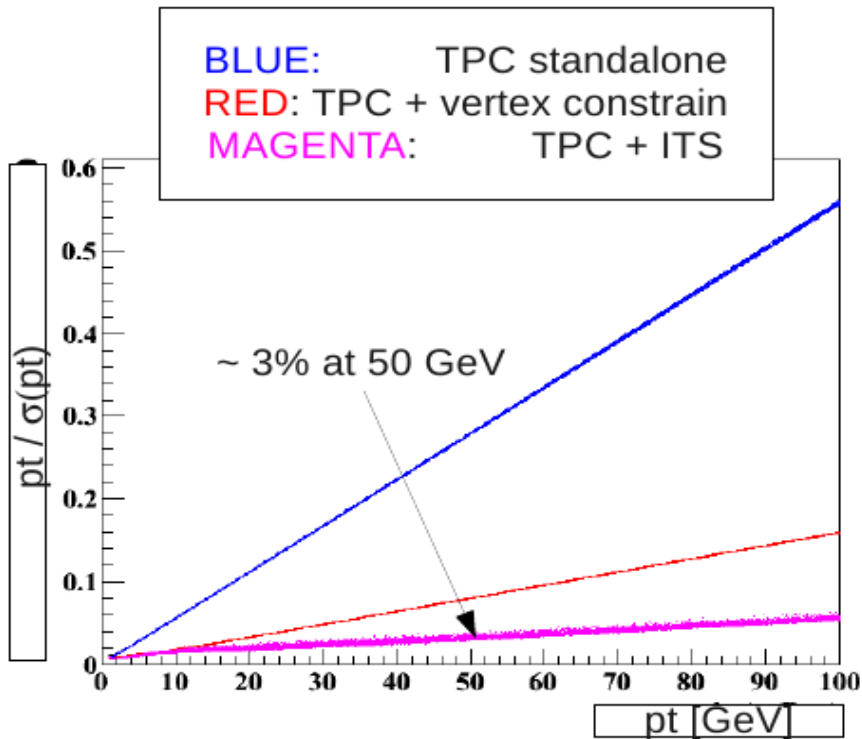
-> Resulting 1/pt errors



Where we are

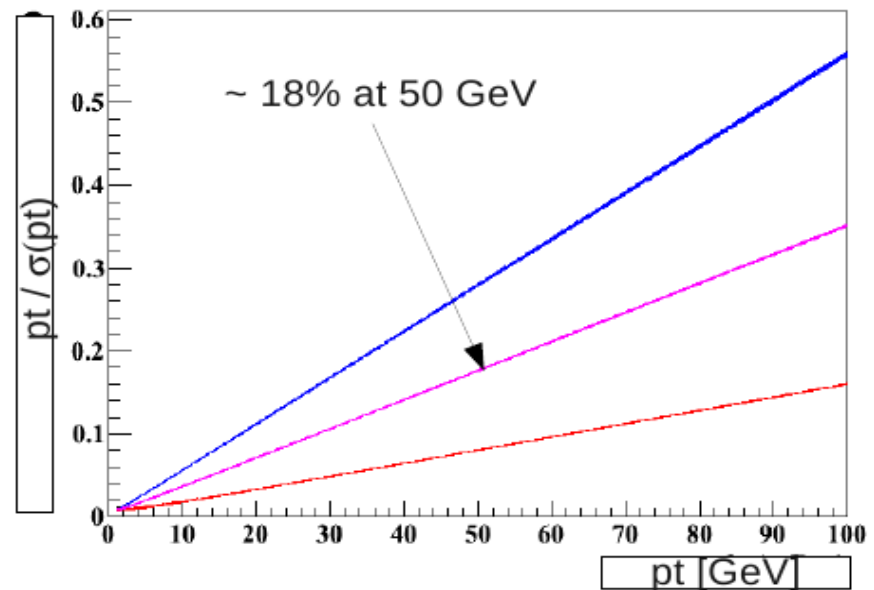
Intrinsic $1/pt$ resolution

IDEAL MONTE CARLO



PASS 2

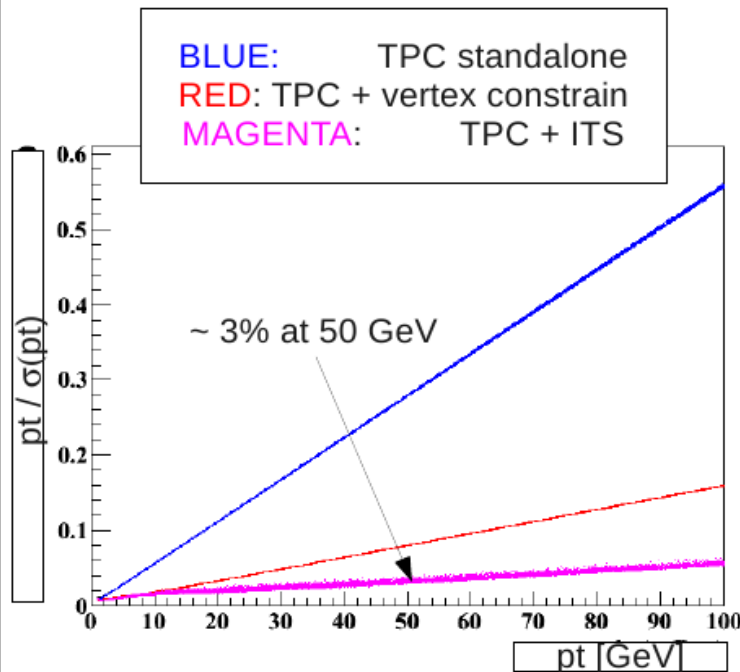
(increased errors in cov.matrix at TPC-ITS boundary due to non-final calibration)
 $dly \sim 500 \mu\text{m}$; $dsnp \sim 1 \text{mrad}$



What we want to achieve

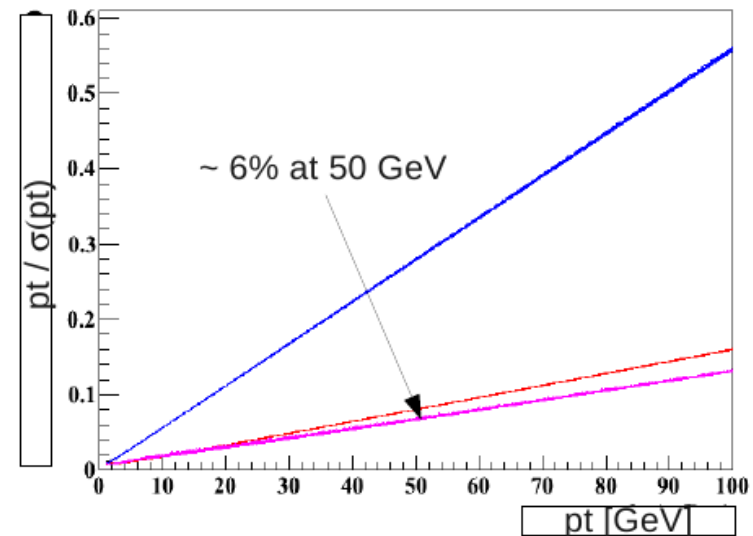
Min. requirements for ITS-TPC matching

IDEAL MONTE CARLO

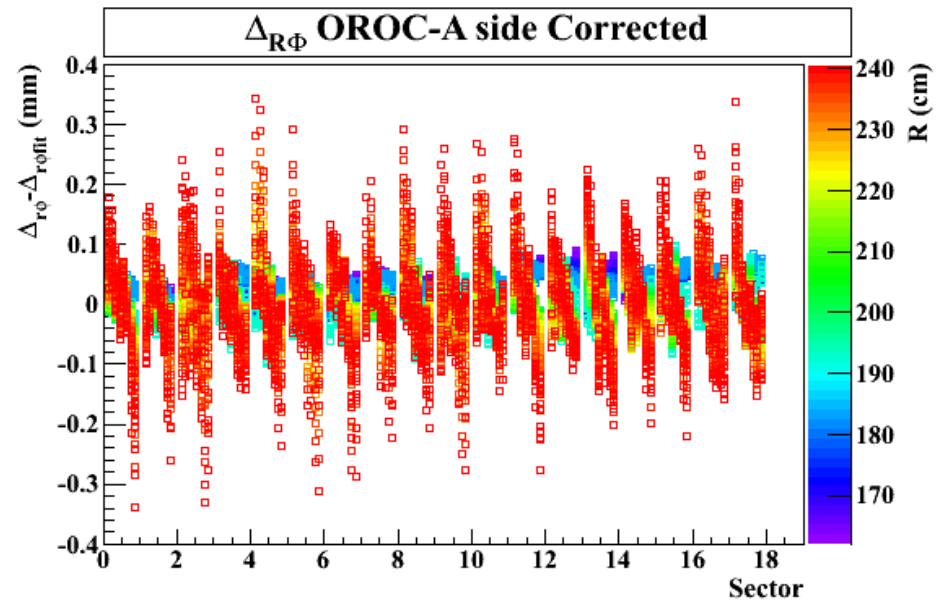
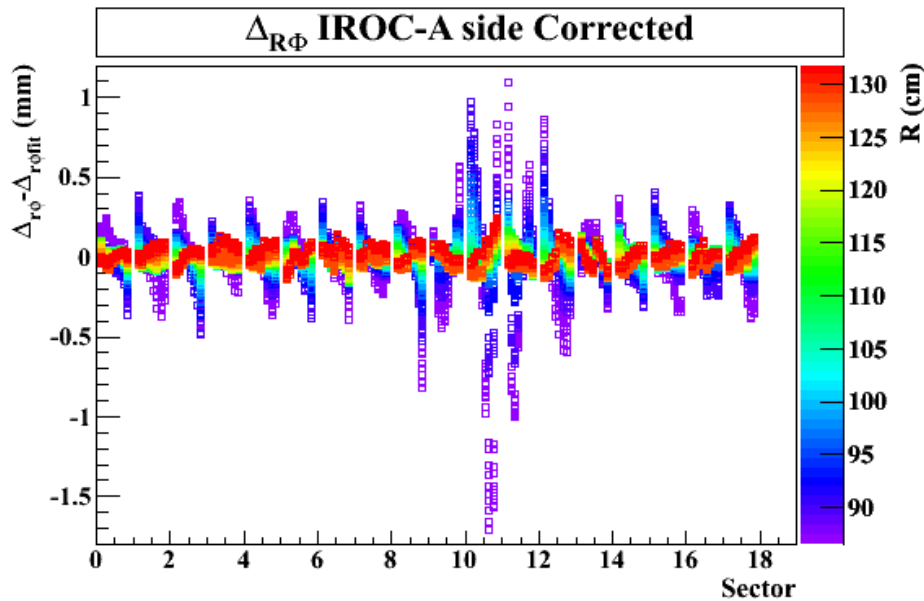
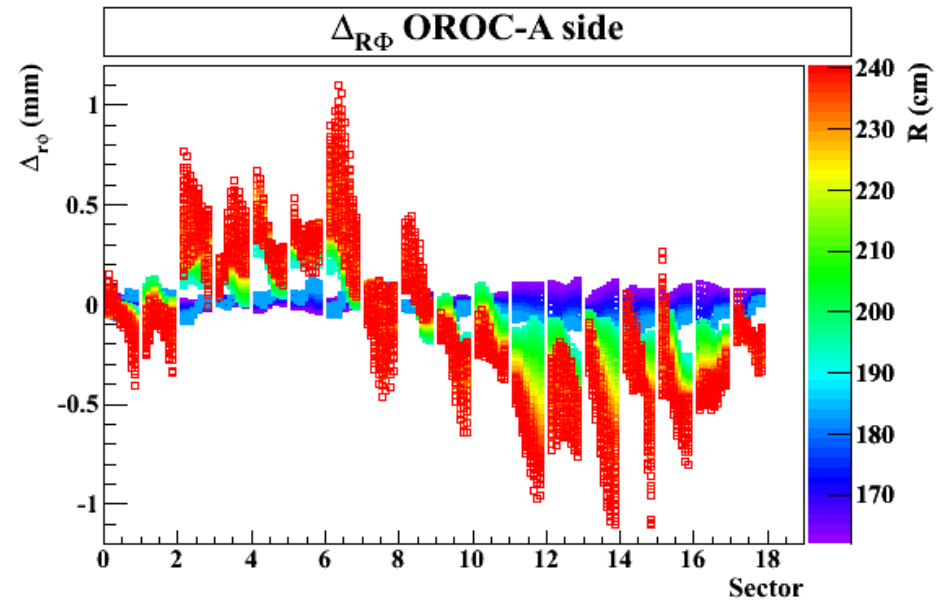
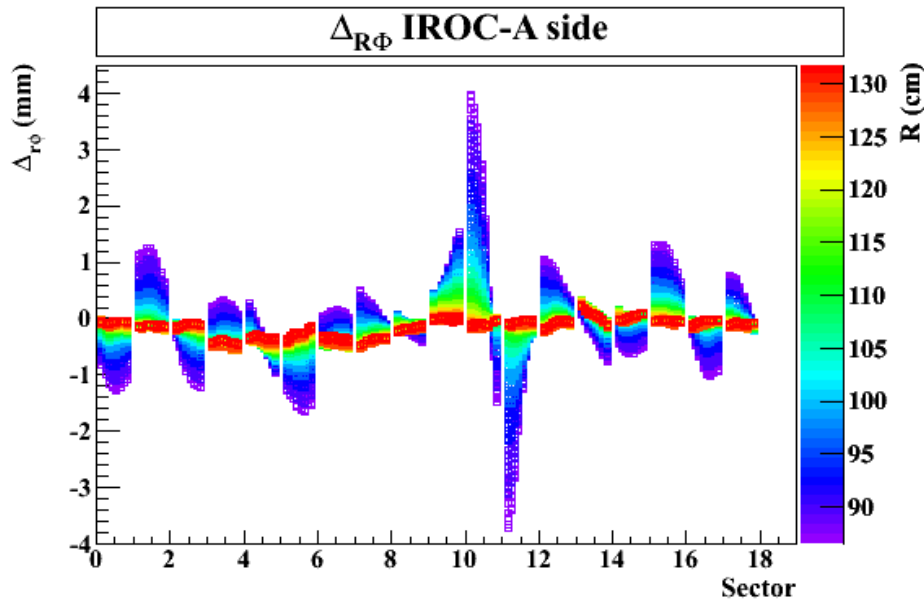


AIM : PASS ???

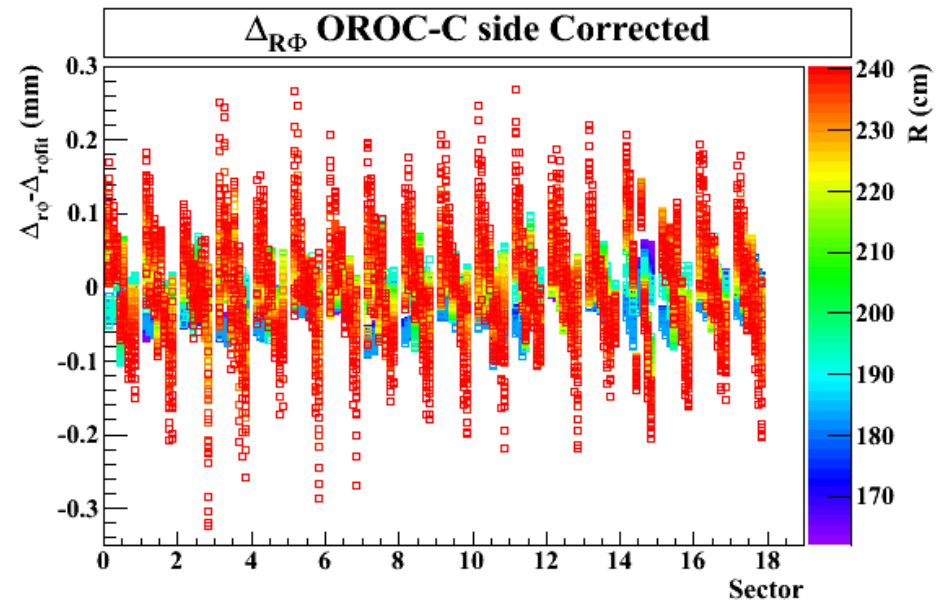
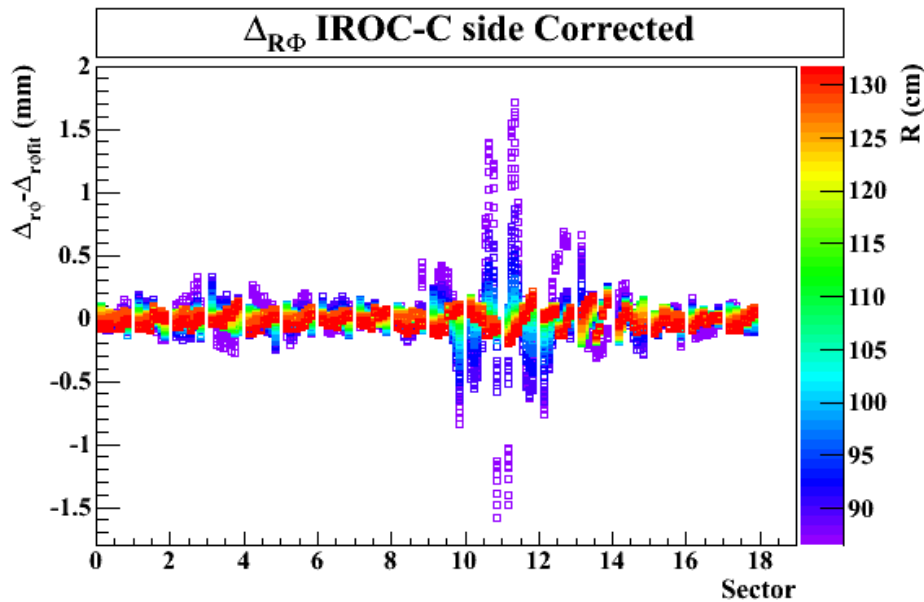
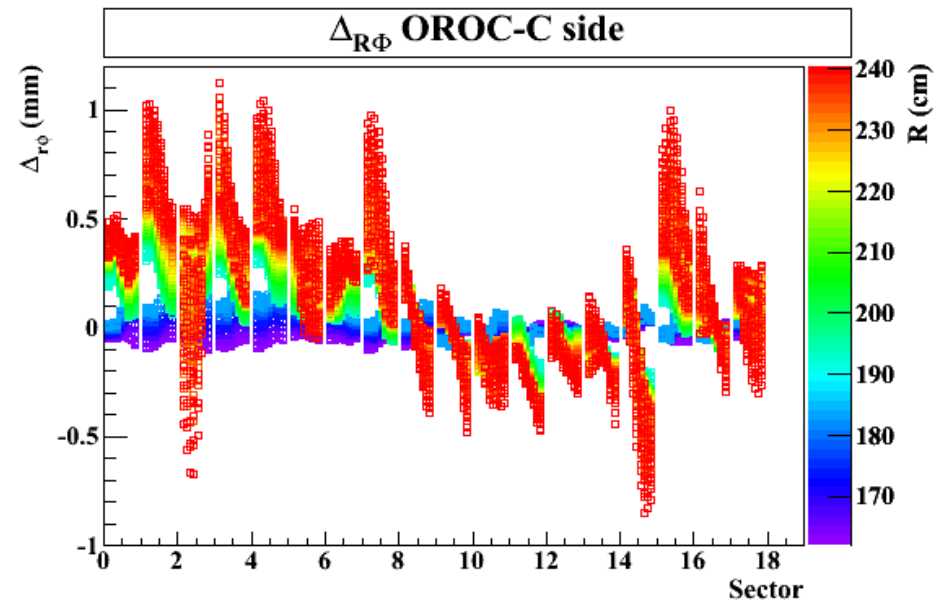
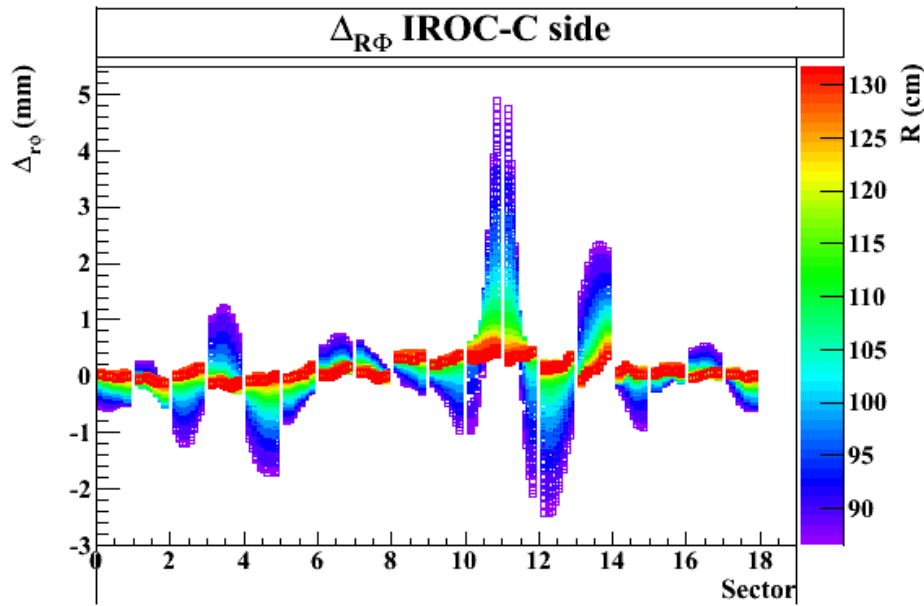
Error estimate on TPC-ITS boundary
smaller than
 $\sigma_y \sim 125 \mu\text{m}$; $\sigma_{\text{snp}} \sim 0.25 \text{mrad}$



E field distortion A side



E field distortion C side



Current status

Calibration due rod shift (phi modulation) finished

Missing points E field distortion due to the ROC,
Central electrode and the field cage
misalignment

Remaining problems:

Relative position of the detector change in time (+
Deformations ?) change with B polarity

Laser tracks used for calibration are moving (sigma ~
0.2 mm)