Beta-Beating due to Longitudinal Shifts of Triplet Quadrupoles

- *Shift of the triplet ensemble is more or less harmless with respect to beta-beating!*

- *What counts is the "relative" shifts between the triplet quadrupoles.*

- *I have therefore maximize these relative shifts to find the worst case.*

Cases (units mm)

- **IR1R**
  - *Q1: -3 ±5*
  - *Q2: -8 ±5* ➜ *-4*
  - *Q3: -1 ±5*
- **IR5R**
  - *Q1: -4 ±5*
  - *Q2: +7 ±5* ➜ *+4*
  - *Q3: -6 ±5* ➜ *-3*

- **IR2L**
  - *Q1: 8 ±5* ➜ *+4*
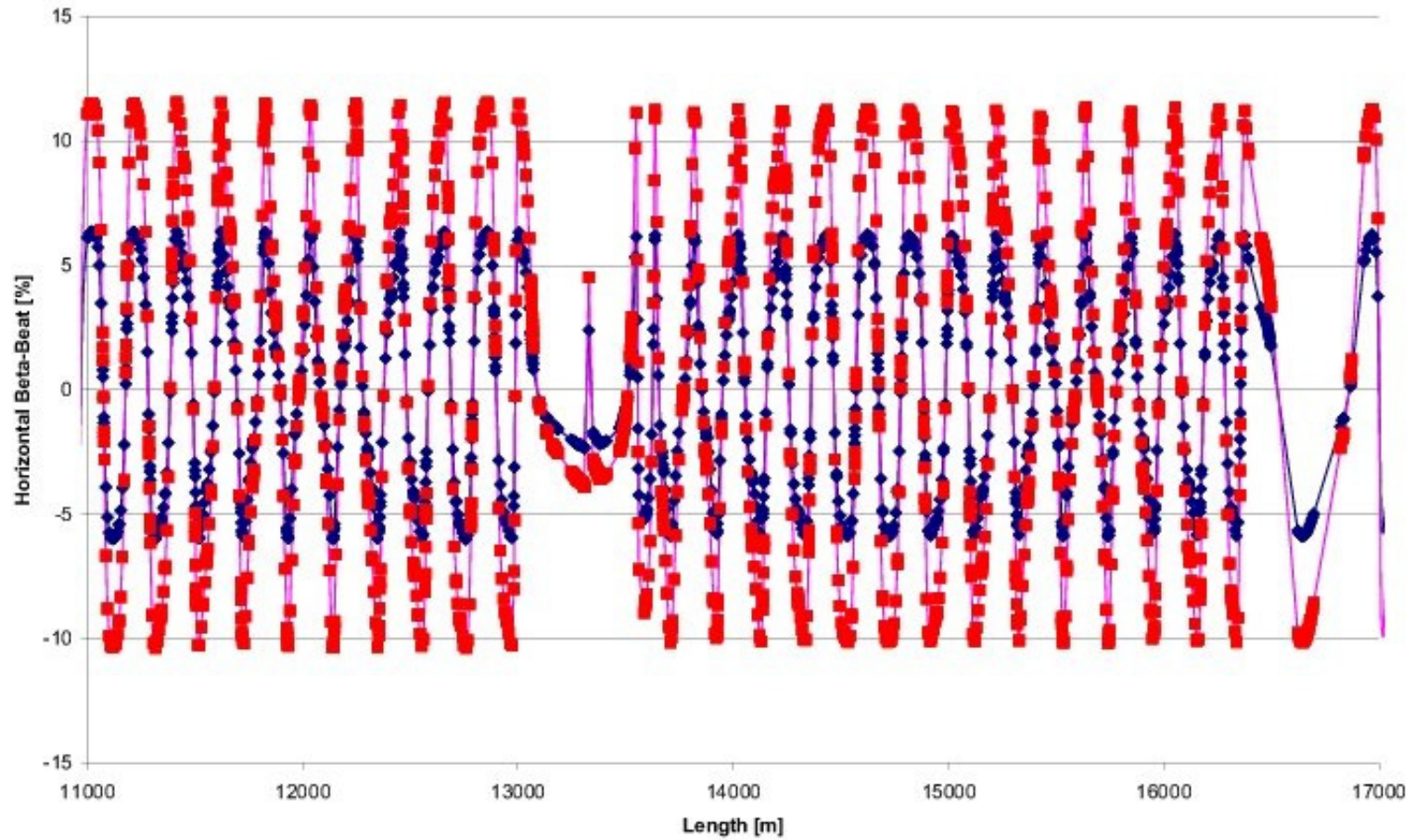 - *Q2: -3 ±5*
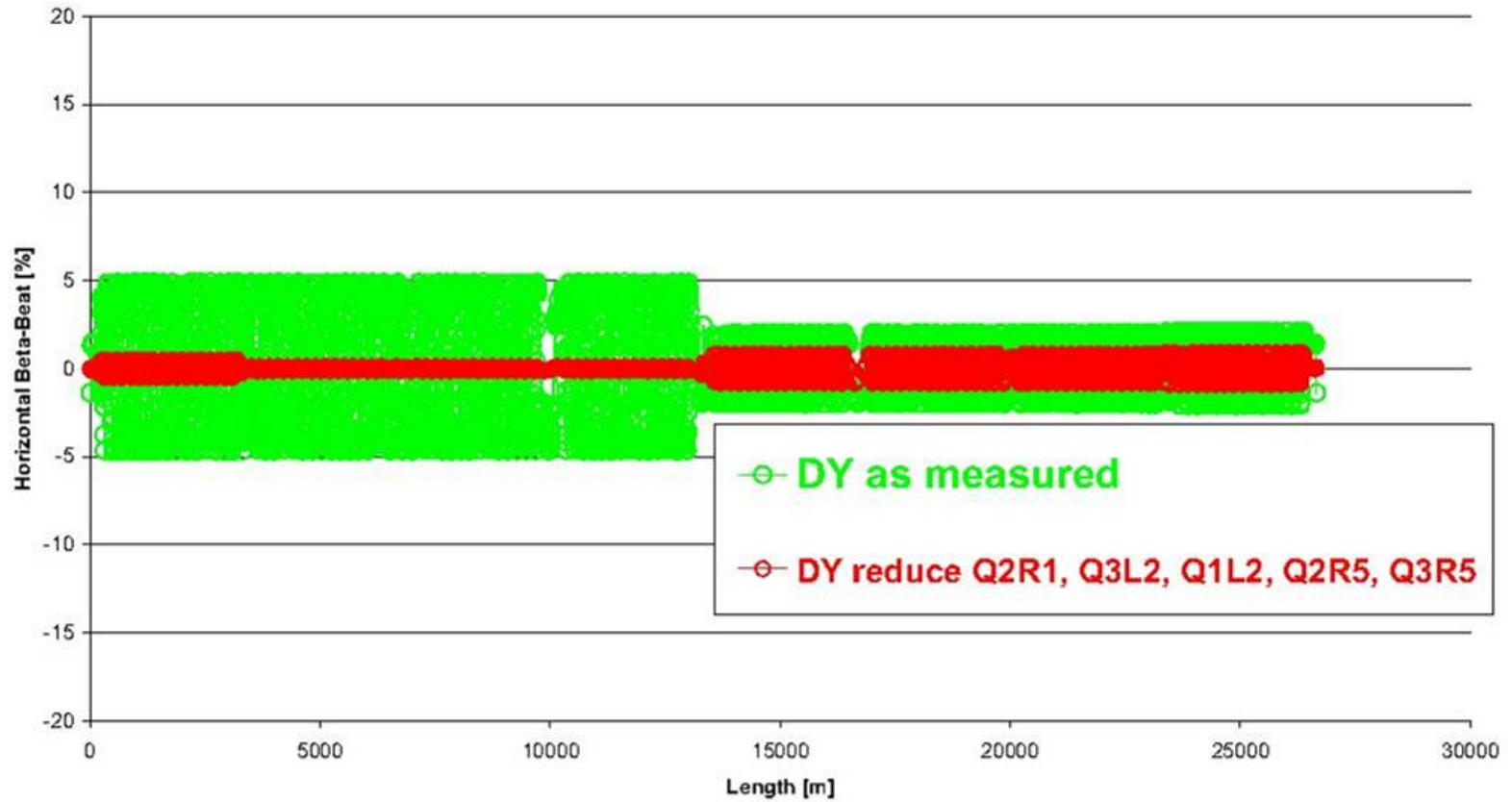 - *Q3: 7 ±5* ➜ *+4*

IR1R - 10mm shift of all 3 Quads
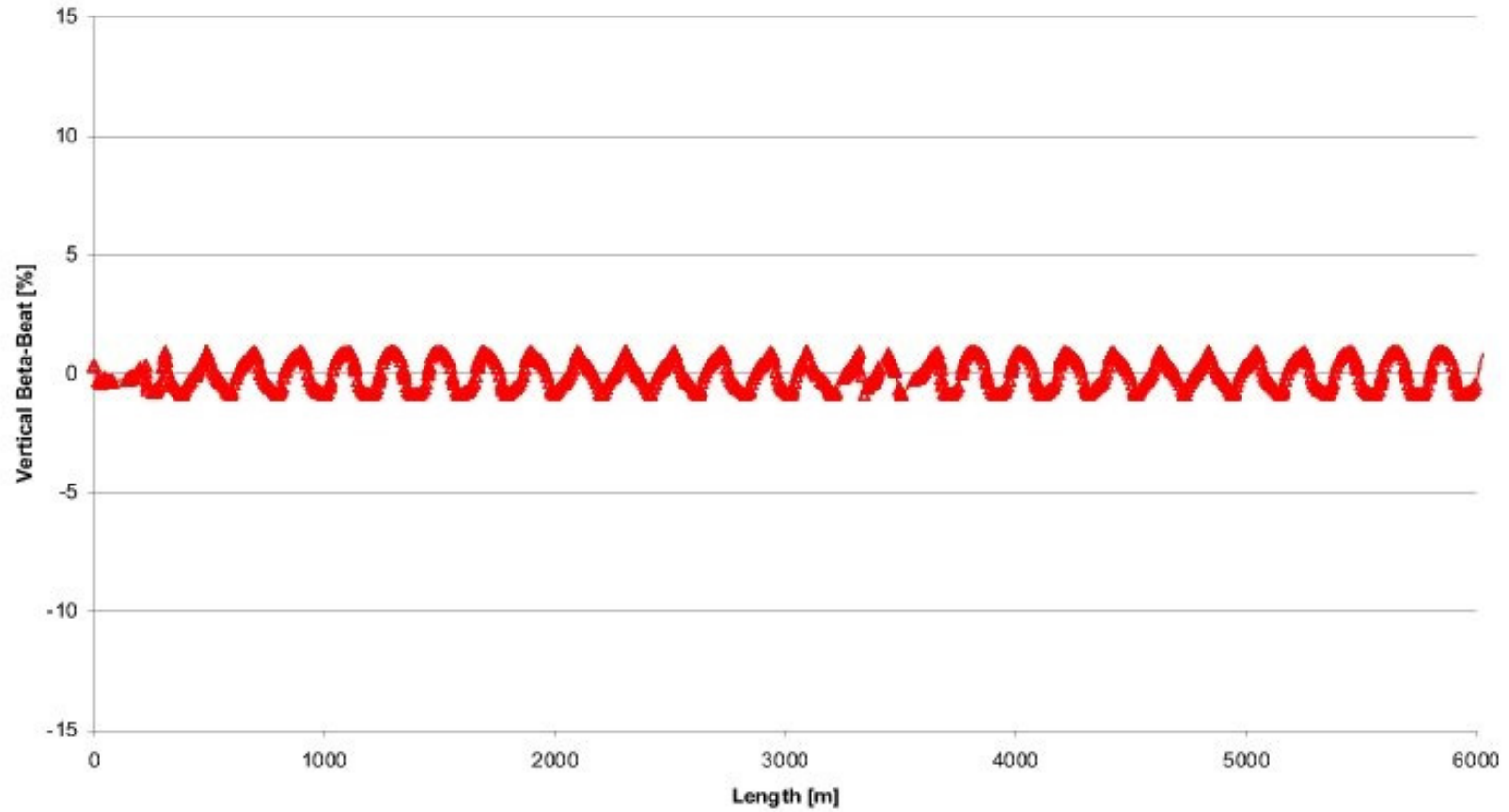
IR1R
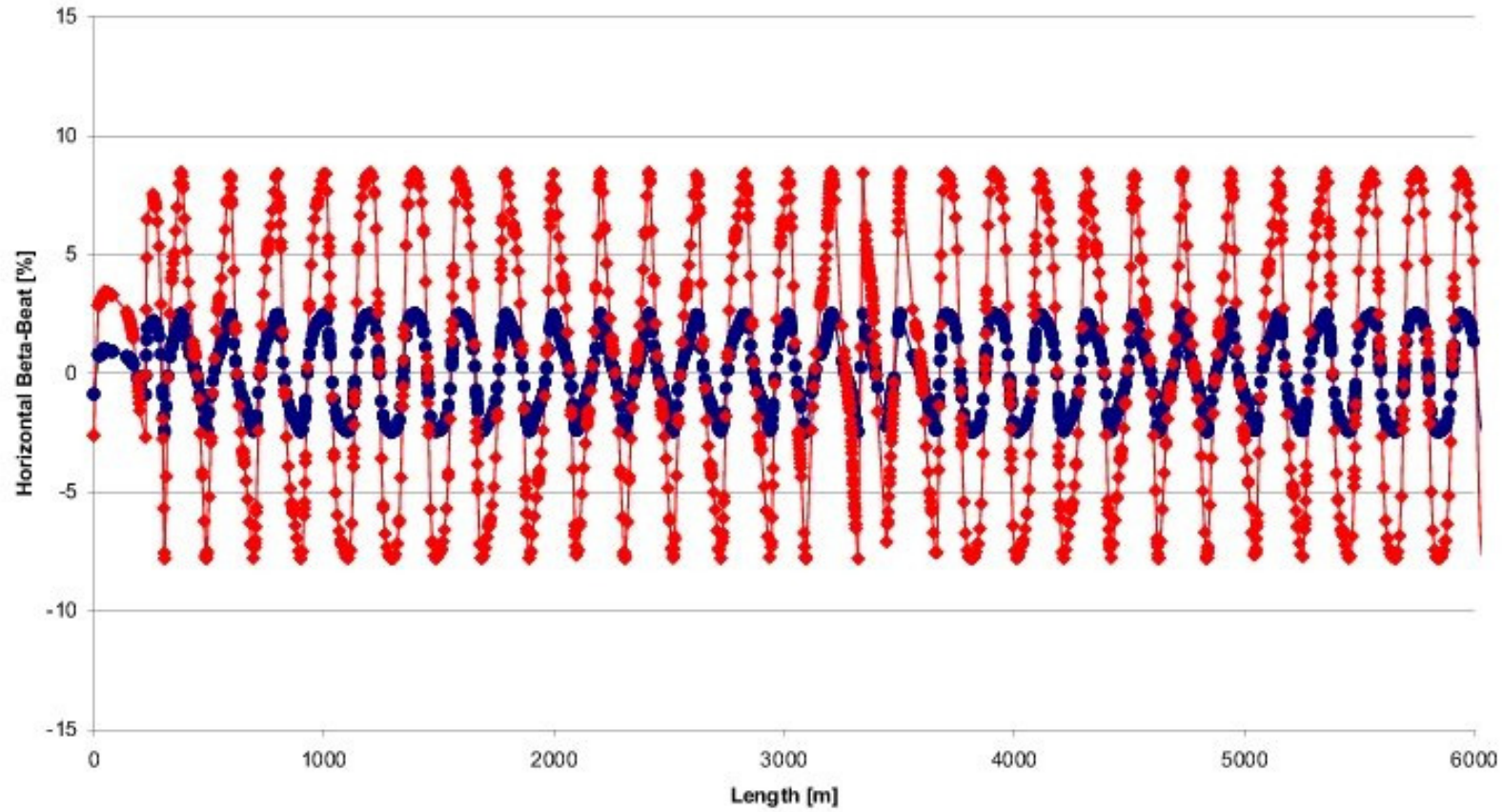
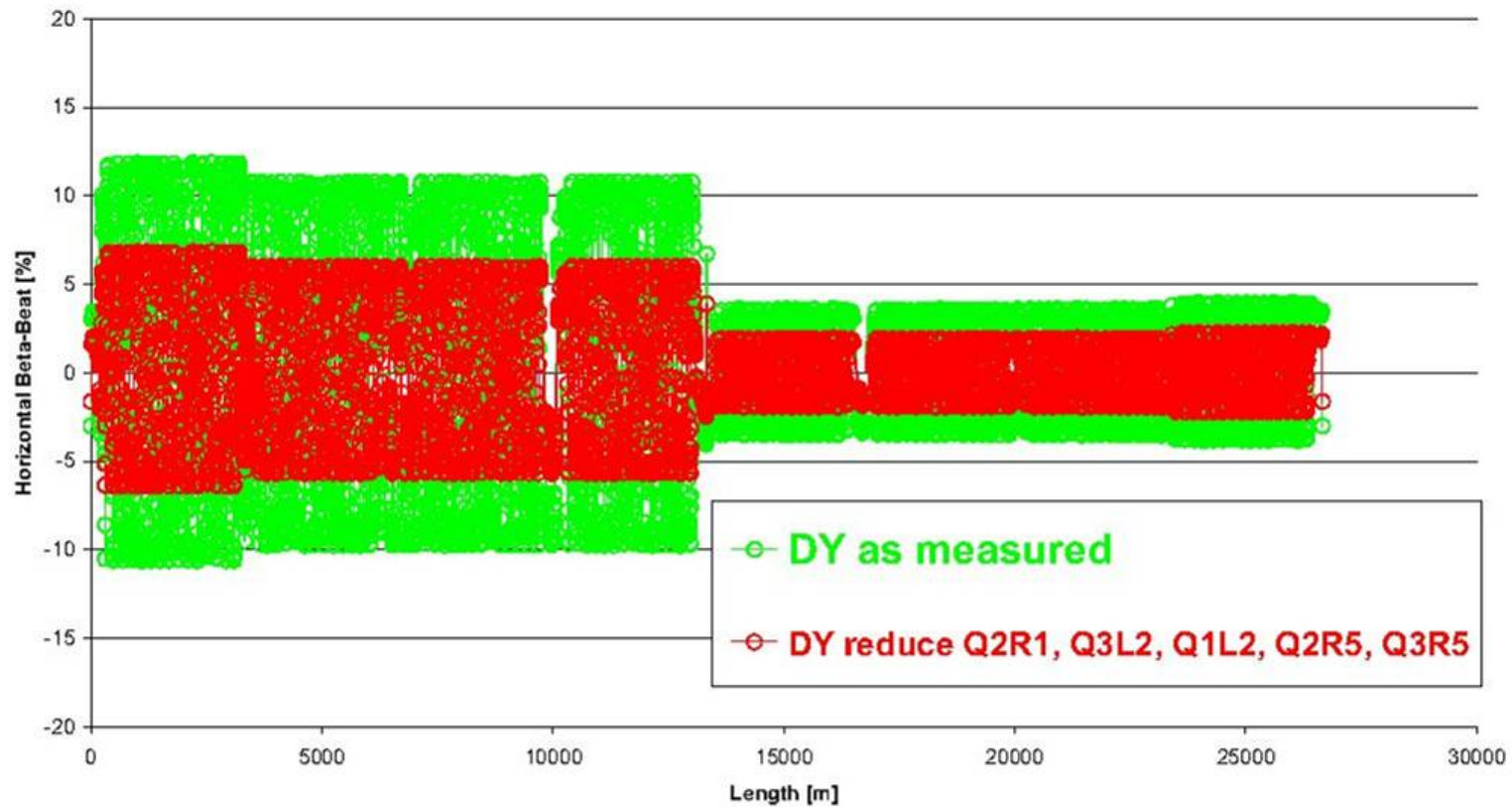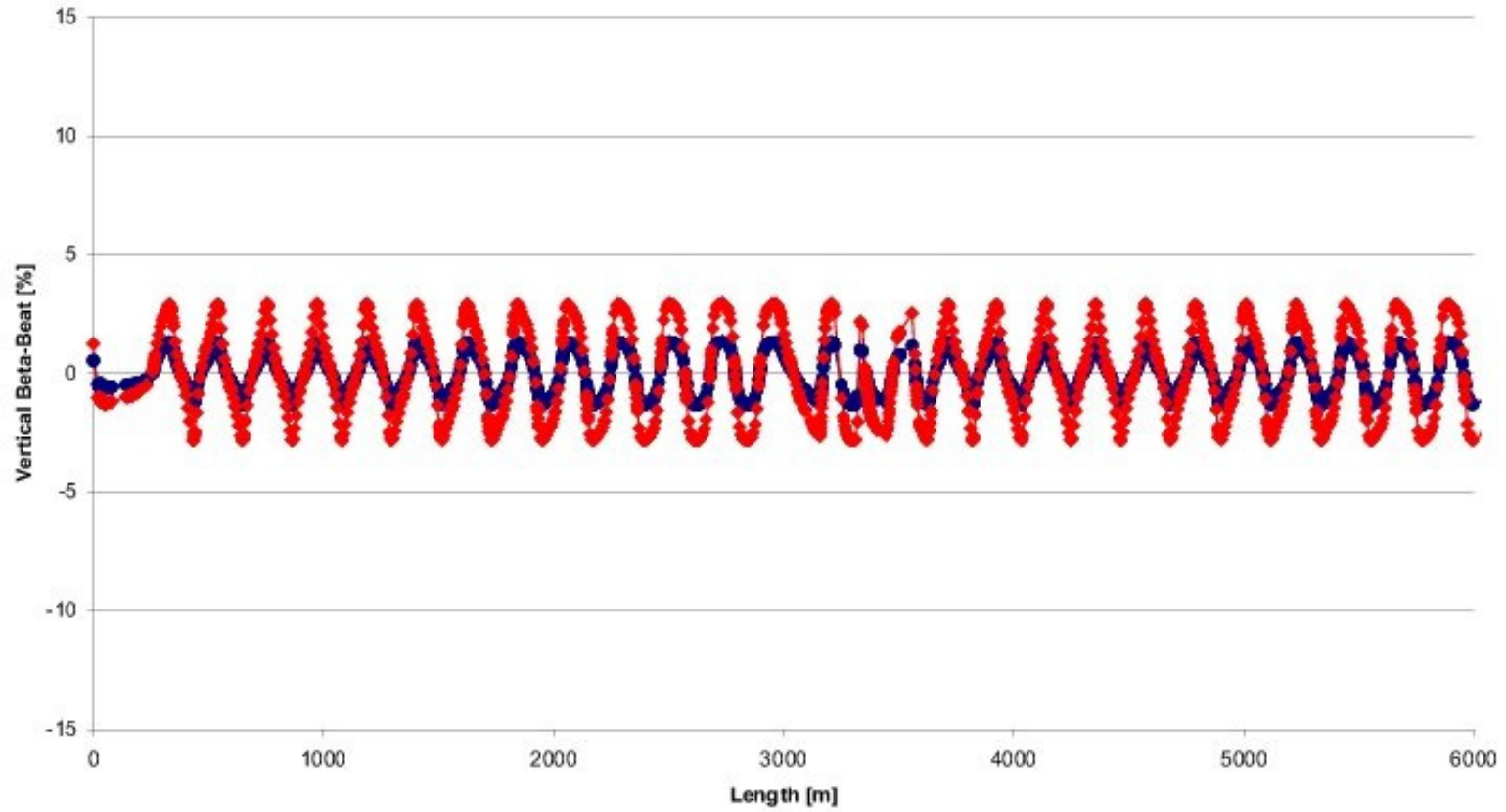# IR5R

DY Average

DY (worst case)

Discussion

- *Relative DY shifts between the triplet magnets should be well below ~10mm.*

- *With minor additional DY shifts one can "cure" the beta-beating problems due to the triplets.*

- ***However:** Does the large measurement error of ±5mm allow the desired reduction of the relative DY shifts ➔ under discussion.*

- *Ranko is analyzing Fermilab DY measurements at warm and cold to get a better understanding.*

- *How shall we consider these longitudinal shifts in our LHC lattice description?*

IR1R

IR5R