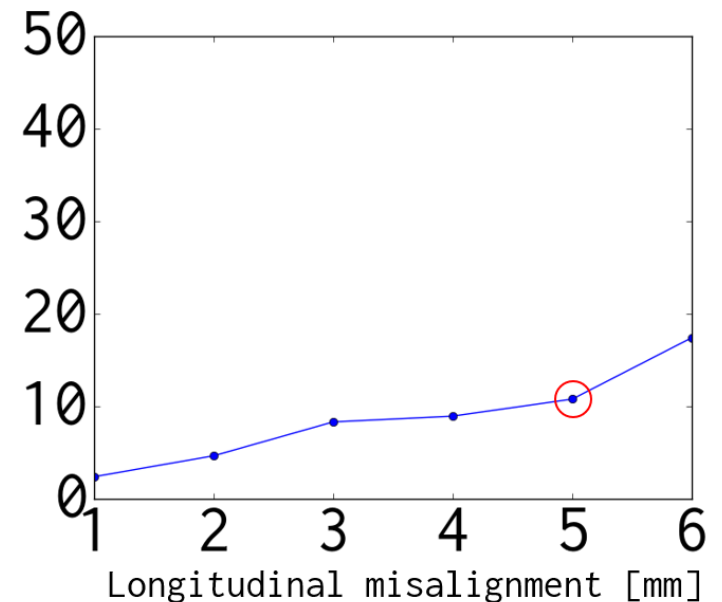
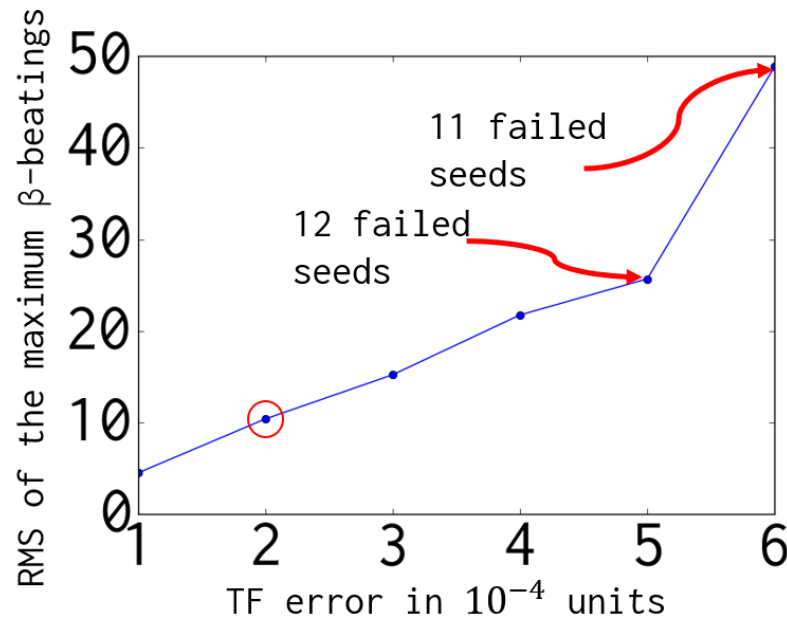


# Triplet longitudinal misalignments in LHC

- In LHC longitudinal misalignments cannot be measured
- A shift of 19mm was estimated for one Q1 in IR5, which can create 20% beta-beating at  $\beta^*=55\text{cm}$ .
- Beam data could not confirm this shift as apparently TF errors in the triplet are about 20 units.

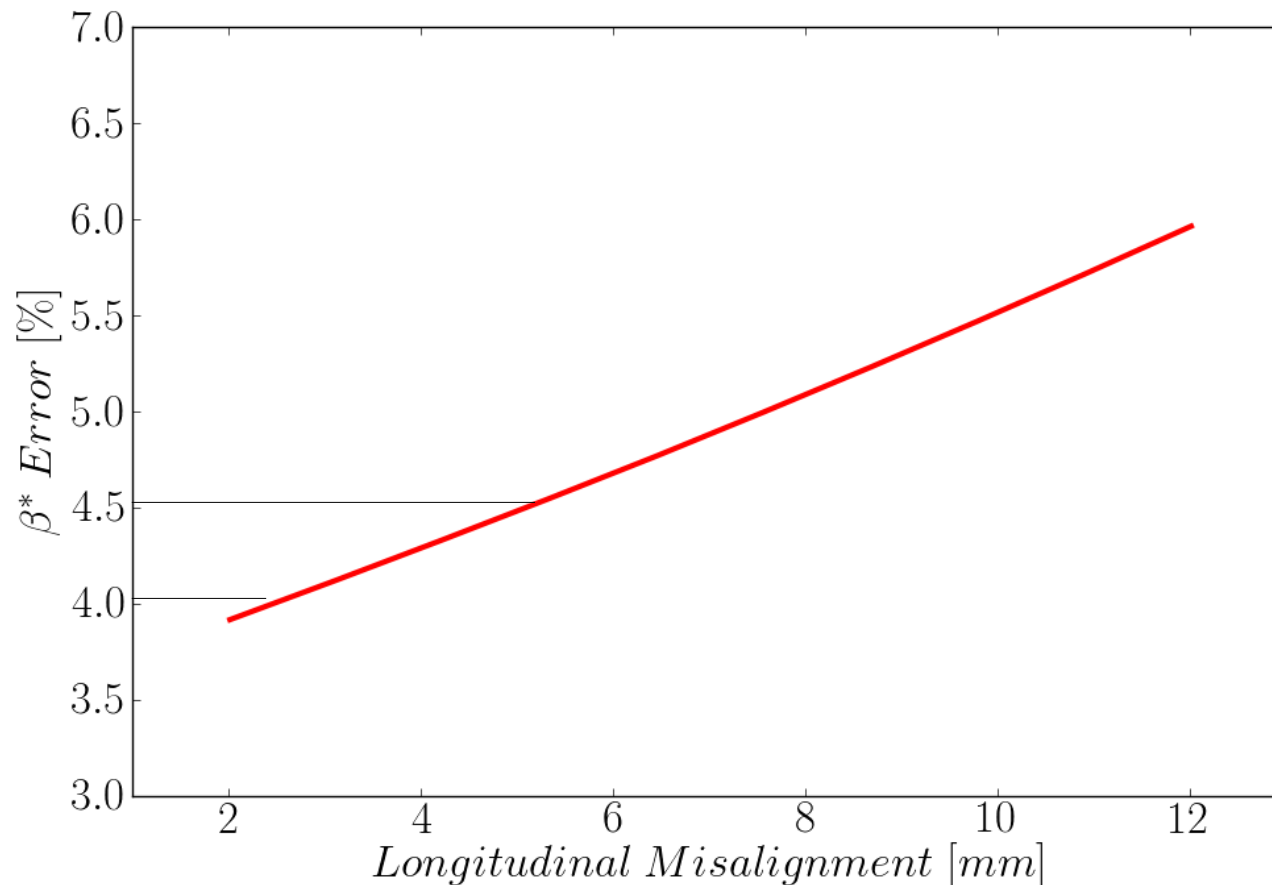
# Equivalence between long. misalignments and TF error (HL)

- Effect of the errors in the triplet without correction
- 50 seeds per point.
- Independent Gaussian errors in all the quadrupoles of the triplets (IR1/5).



5mm (rms) longitudinal misalignments correspond to 2 units (rms) in the transfer function.  
HL-LHC target is 10 units (rms)

# Beta\* accuracy Vs longitudinal misalignment



Increasing from 2 to 5mm longitudinal misalignments (uniform) shifts beta\* error from to 4% to 4.5% (rms).  
(5mm uniform is about 3mm rms)