β* reach : Long-range beam-beam with 25 ns spacing (round optic)

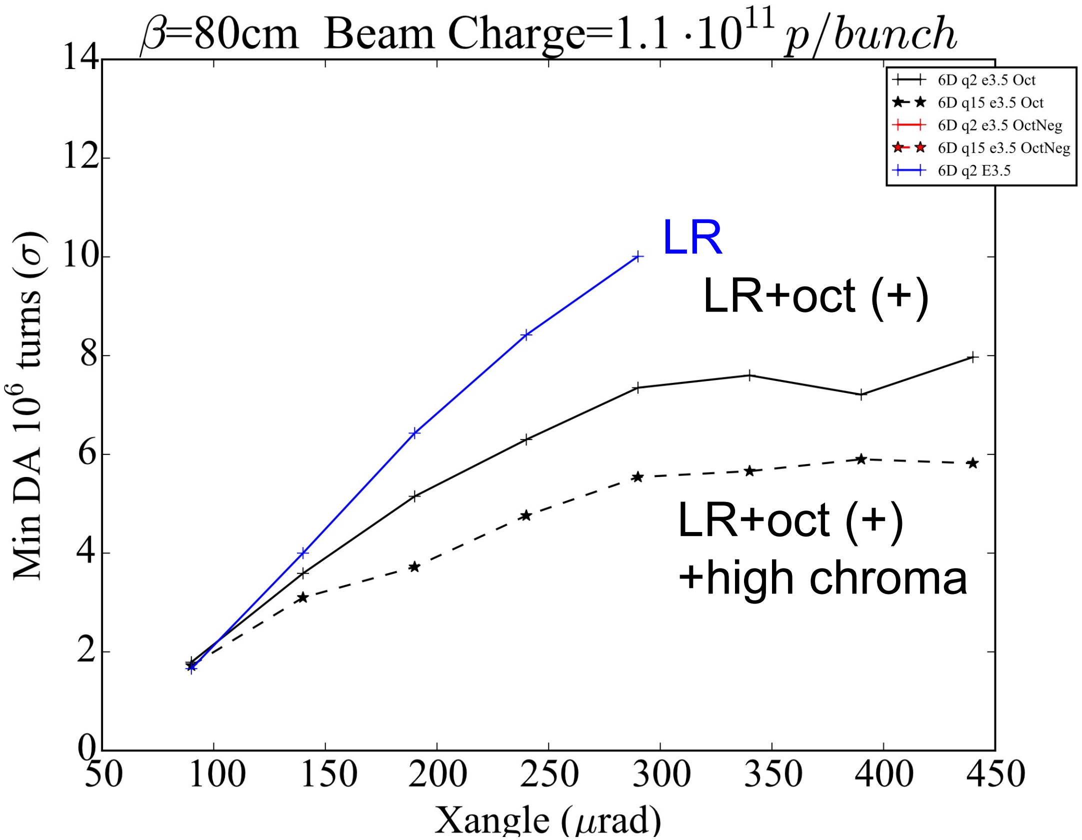
D. Banfi, J. Barranco, X. Buffat, T. Pieloni, C. Tambasco
R. Alemany, G. Papotti, M. Pojer, B. Salvachua, M. Solfaroli

- Study lifetime degradation due to long-range beam-beam interactions

$$d_{sep} = \sqrt{\beta^* \frac{\gamma}{\epsilon_n}}\,\theta$$

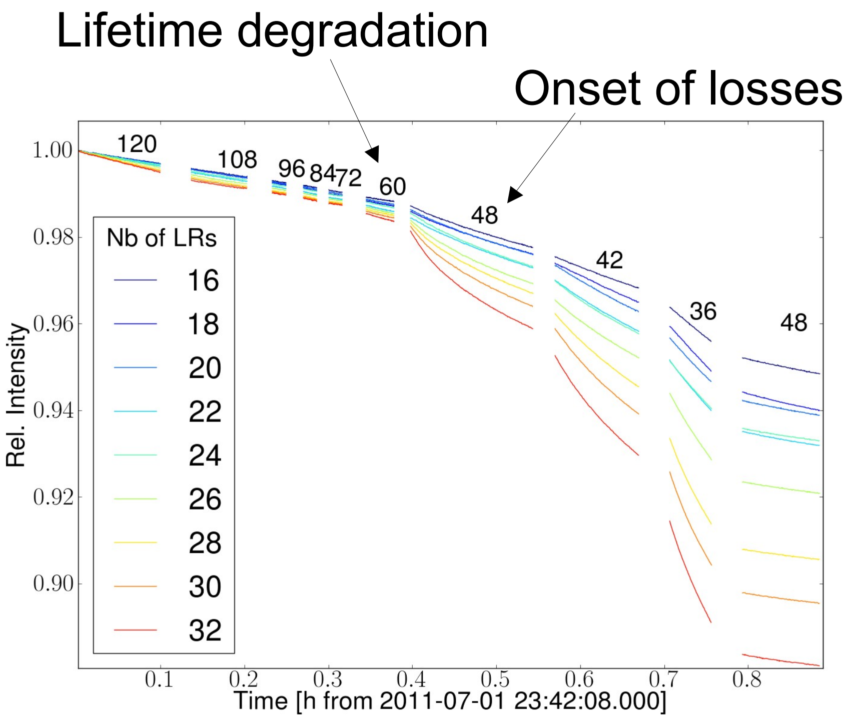
  → Define required beam-beam separation

- Compare with models (DA) and understand the main players in the single particle dynamics
  - → Tunes, chromaticity, lattice non-lineraities (e.g. octupoles)
- Time required : 8h
- Next MDs :
  - BCMS beams
  - Flat optics



Procedure
(Identical to the 50 ns LR MD)

- Inject 1 full nominal train per beam colliding in IP1&5
- Go through the standard operational cycle for physics up to collision (luminosity measurement required)
  - Adjust chromaticity to ~2 units
- Reduce the crossing angles (IP1&5) in steps (~1σ) (Adjustment of the TCTs required)
- Monitor beam and luminosity lifetimes as well as losses
- Once the onset of losses has beam reached :
  - Vary the working point (max ±0.01 in both planes)
    - Reduce further the crossing angles if the lifetime is significantly improved
- Step back in crossing angle (or re-inject depending on the beam quality)
- Depending on the outcome of the 50 ns MD :
  - Adjust chromaticity to ~15 units and repeat the crossing angle scan
  - Reduce the strength of the octupole while colliding and repeat the crossing angle scan
- EOF : Measure transverse emittances with fast VdM scans



Needed :
- Luminosity measurement
- TCT movements
- FBCT, BLM
- Tune and chromaticity control

Wanted :
- BSRT
- Schottky
- BTF (EOF)

BACKUP
DA with negative polarity of the octupole