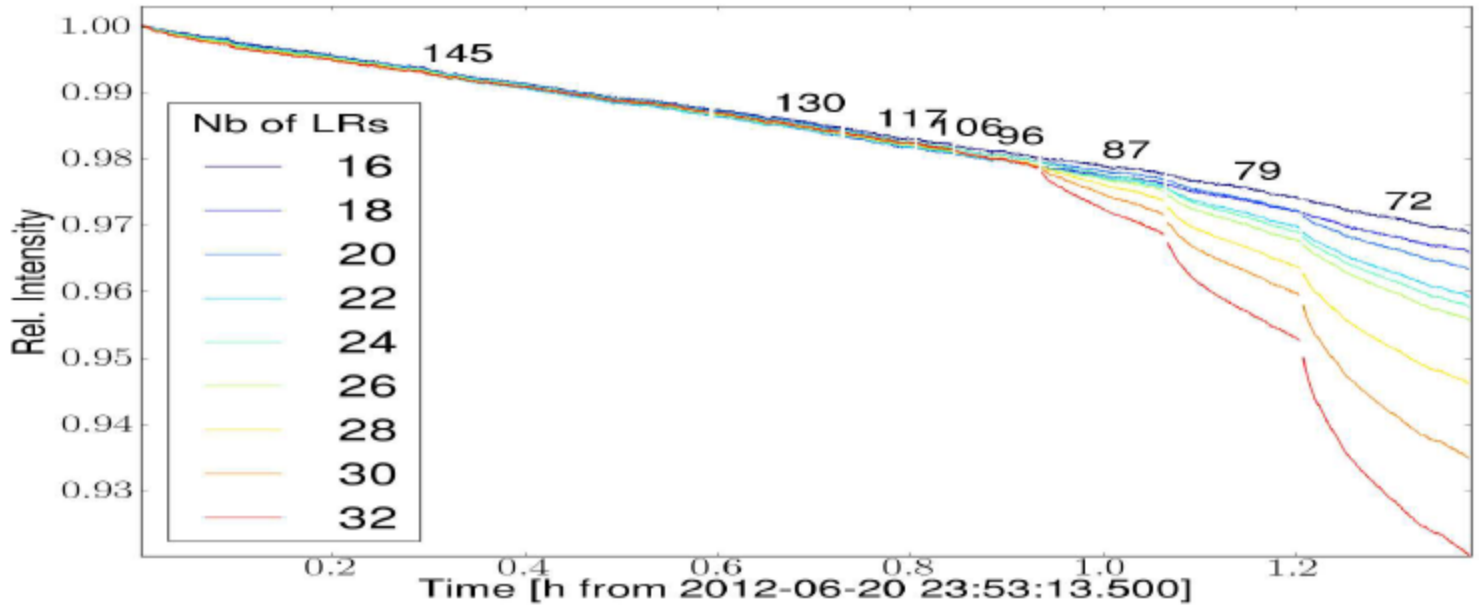
Long range MDs with 25 ns beams

Beam-Beam team

Purpose and motivation: long range MD

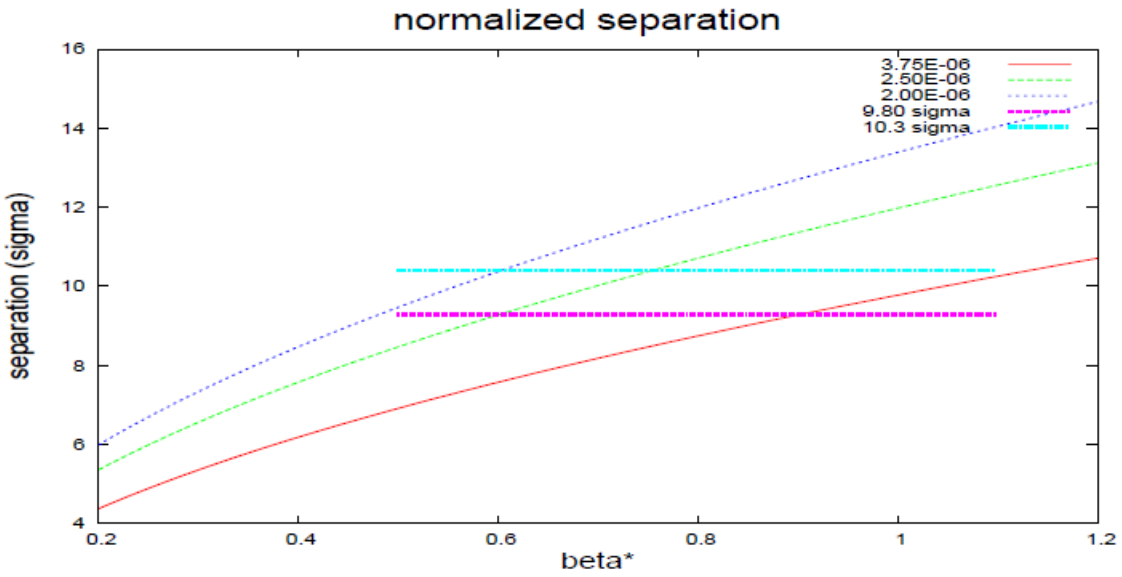
- Effect of long range encounters on dynamic aperture and losses
  - Reduced separation and increased number of long range encounters
  - How relevant are PACMAN effects with more long range
  - For 2015: extrapolation of performance and parameter range (25 ns vs 50 ns, β, crossing angle, ...

Example: last MD



- Losses as function of separation (crossing angle)
- Reduction of dynamic aperture and PACMAN effects very visible
- We verify the onset of long range effects

Scaling



- Increased emittances reduces separation by 2 σ
- With 25 ns (double number of LR encounters) expect a reduction of dynamic aperture by 1 σ
- Effect of IP2 and IP8

Requirements

- Sufficient dynamic aperture at start of experiment:
  ➔ Standard setup with β = 0.6 m and larger ε is critical

- Change of separation (crossing angle) during MD
- Two fills in collision (measurements for 2 hours each):
  - 1 train of 72 bunches per beam, colliding in IP1 and 5
  - 2 trains of 72 bunches per beam, additional head-on collisions