

# Beam-beam MDs priorities

## 1<sup>st</sup> MD slot

- Luminosity Leveling with offsets in IP1&IP5
  - 2 hours during regular fill with full trains minimum 228b or 264b
- Leveling with  $\beta^*$  with constant crossing angle
  - at 1 IP at constant crossing angle (alternative to offset) MD request by S.Redelli
- BB limits, long-range, effect of intensity
  - 50 ns spacing and high intensities
- Beam-beam limit head-on for unequal beam sizes
  - different emittances and/or  $\beta^*$
- Emittance growth with noise and beam-beam
- Transverse noise and coherent beam-beam
- Collisions with alternative working point (half-integer)
- Beam-beam Limits, long-range, effect of separation
- Long-range beam-beam effects with pseudo flat beams ( $\beta_x \neq \beta_y$ )
- HV compensation

Back-up slides

## Leveling with offset

- Experiments request Lumi reduction to 80% Nom → offsets at collision of 1-1.5  $\sigma$  at IP1 and IP5
- Few hours during regular fill with full long-range encounters **as in normal operational scenario**
- Observe beam lifetimes and losses for long time
- Make sure no degradation of beam parameters (emittance growth) over a fill
- Discussions at LMC tomorrow

## Leveling with $\beta^*$ with constant crossing angle

- For details see MD request by S. Redaelli for the Squeeze Team

## Beam-beam Limits: LR high intensities

- Find possible long-range limits:
  - 50 ns beams with full complement of long-ranges in IP1 and IP5
  - High intensities as proposed for 2012 run  $1.7 \cdot 10^{11}$  per bunch
- Only at top energy, fully squeezed
- Define criteria for separation by reducing crossing angle
- Observations:
  - beam lifetime and losses for different crossing angles
  - emittances as function of crossing

## Other BB MDS

- Head-on with unequal beam sizes
  - Emittance growth with noise and beam-beam
  - Transverse noise and coherent beam-beam
  - Collisions with alternative working point (half-integer)
  - Beam-beam Limits, long-range, effect of separation
  - Long-range beam-beam effects with pseudo flat beams
  - HV compensation
- MD results from RHIC then later in 2012 if not conclusive
- Partly done 2011 LR vs crossing angle  
2012 with two  $\beta^*$  (normalized sep vs crossing angle)
- Optics not yet available later 2012
- Only possible at 7 TeV not enough aperture to cross HH and single bunch Schottkys available for observations