Beam-beam activities 2012 + 2013

For beam-beam studies WG, ABP + OP + RF ...

Activities in 2012

■ Beam-beam studies (i.e. MDs)

▷ Effect of noise on head-on tune shift (at LHC and RHIC), including effect of damper in collision

▷ Establish scaling laws for long range effects (intensity, number of encounters, separation), supported and explained by analytical model (in collaboration with D. Kaltchev)

▷ Set up a high pile-up run ($\approx$ 70 events per collision) with high intensity

▷ Test run with 72 bunch trains and 25 ns spacing prior to physics run

▷ Proposed levelling with β^*, first tests in machine (with OP) successful

Activities in 2012

■ **Operation and commissioning (i.e. not MDs)**

➤ Studied losses and instabilities, often few selected bunches. Follow up of all observations

➤ Identified as loss of Landau damping due to missing collisions (as expected and predicted)

➤ Developped tools (stability diagrams, beam-beam simulations with impedance) to analyse in detail

➤ Proposed change of beam processes and filling schemes to mitigate the problems

➤ Simulated and measured effect of octupoles on chromaticity and stability, results became part of operational procedures

➤ Study possible beam-beam related systematic effects during VdM scans (with ATLAS)

Activities in 2012

■ **Proposal for beam-beam workshop**

  ➢ Accepted as ICFA mini-workshop

  ➢ Set up international and local organizing committees

  ➢ Define sessions and chairpersons

  ➢ Preliminary programme and invited presentations

■ **Others: contributions to IPAC, workshops, schools, students training, ...**

Foreseen activities in 2013

- Beam-beam workshop (18. - 22.3. 2013):

  ➢ Set up final programme

  ➢ Several contributions by team members

  ➢ Summarize outcome in a monograph

- Analysis of beam-beam observations

  ➢ Complete analysis of observations

  ➢ Set up simulation tools where needed (strong-strong and instabilities, include impedance effects, ..)

- For LHC after LS1

  ➢ Study possible scenario, including flat beams

  ➢ Understand possible limits on head-on beam-beam