Review of pending actions

G. Arduini
• **Layout**
  
  – **Follow-up of KEK:**
    
    • Need to understand the proposed changes resulting from integration studies and from magnet review ➔ Discussion with Paolo possibly before Christmas or at the beginning of January (Massimo, Riccardo, Gianluigi)
- **Optics:**
  - Pending items for HL-LHCv1.0/v1.1:
    - tools for HL-LHCv1.0 Beam 2
    - Squeeze transitions, VdM optics in IP2/8, tools for HL-LHCv1.1
  - Mid January (Riccardo)
  - Requirements for optics measurements and correction including strategies for $\beta^*$ levelling in IP1/5/8:
    - BPM accuracy
    - K-modulation
  - Aim for end January (Rogelio)
  - Constraints from aperture at the TAXS (injection and maximum transverse IP displacement) and definition of the criteria used for aperture calculations at injection ➔ End of February (Massimo, Riccardo, Roderik)
Optics and Layout

- Powering and tolerances:
  - Input provided at the KEK meeting. Discussions ongoing with WP3/6. Need a joint meeting to finalize the proposals and requirements on our side, including k-modulation ➔ Mid February? (Massimo, Miriam, Riccardo)
  - Specification for tolerances for tilt-angle of the triplet/matching section elements (Massimo, Miriam)
Field quality

- Field quality and impact of multipolar errors evaluated for HL-LHCv1.0 without beam-beam
- Impact of field errors with beam-beam small but not negligible for HL-LHCv1.0 ➔ identify those that have the largest effect ➔ Mid January? (Danilo, Tatiana)
- Effect of large chromaticity and octupoles on dynamic aperture without and with beam beam ➔ Mid March? (Massimo, Danilo, Tatiana)
Field quality

- Effect of Crab cavities field quality:
  - Review of the tools available in Sixtrack: joint Task 2.3/2.5 Meeting
  - Are we happy with the crab cavity field quality? Is the criterion of 4% emittance blow-up rate per hour reasonable?
• Carb Cavities:
  – Impedance reduction measures for crab cavities
  ➔ Meeting on 10/12/2014
  • What can we gain from spread of the modes?
  • Tolerances for mode control
  • Is mode damping the right solution?
  • Evolution of the stability limit as a function of the squeeze
  • What can we learn from SPS experiment on that?
Electron Cloud Effects

- Heat loads:
  - Provided estimates for heat loads in the triplets and matching sections for IP1/2/5/8
  - Triplet in IP1 and 5 require SEY reduction measures
  - Triplets in IP2 and 8 require SEY reduction measures if cooling capacity limits confirmed
  - The situation of the matching sections is less evident and the requirements will depend on the SEY that we will be able to achieve in 2015
  - Summarize the various contributions for the beam screens in tables for the e-cloud and for the resistive terms. ➔ Elias, Nicolo
  - On general it might be good to have a comparison heat loads vs. cryogenics limits, including heat deposition ➔ Ready for a possible discussion on a TC meeting?
• Electron Cloud effects:
  – Instability threshold resulting by electron cloud in areas where SEY threshold < 1.2-1.3  ➔ End of March 2015 (Giovanni)
  – Effect of beam screen baffles on electron cloud-build-up and cold bore heat load. Difficult geometry  ➔ End of April 2015 (Giovanni)?

• Synchrotron Radiation in the HL-LHC:
  – Should we review the situation in the matching sections. Adriana Rossi did it for the LHC. WE could ask her to review the situation for HL-LHC
Impedance/e-cloud/Intensity limits

• Impedance related aspects:
  – Update on BPMs design and impact on impedance
  – Update on Beam screen design and impact on impedance
    • Soldering of W and Cu

• 11 T dipoles: Vacuum valves at the cold-warm transition
  • Difficult to install RF-shielded gate valves at the extremity of the cold to warm transitions. Can we install valves without RF shielding?

• Update by the end of February (Elias, Nicolo’
Beam-Beam

- Implementation of Beam-Beam module in the Sixtrack and documentation ➔ Beam-beam meeting end of the year/mid January (Tatiana, Javier)

- Pacman effects in HL-LHC:
  - Asymmetry IP1/5 observed with TRAIN code to be understood ➔ Benchmarking ➔ End of March (Tatiana)?
Beam-Beam

- Effect of IP2 and IP8 and definition of their minimum crossing angles to remain on the shadow of IP1 and 5:
  - Pacman
  - Effect of dynamic aperture
  - End of March (Tatiana, Danilo)?

- Minimum normalized crossing angle for round (15/15) and flat (30/7.5) beams.
  - When do we start to see core emittance blow-up and impact on luminosity lifetime
  - What is the corresponding dynamic aperture
  - Can we use that for Halo control
  - End of February (Sasha)?
• **BBLR:**
  - Beam Beam compensator in Sixtrack. End of January in a Beam-Beam Meeting (Yannis, Andrey)?

• **BBLR (LHC test):**
  - Update Simulation for LHC tests with latest information on BBC installation (wire embedded in the TCT at 3 mm from the jaw face)
  - Required current settings and set-up of the experiment
  - End of February (Yannis)?
Beam-Beam

- BBLR (HL-LHC):
  - Do we have a set-up that is compatible with TCTs at 9 or 10 (3.5 um) sigma?
    - Take into account that:
      - The wire is embedded in the TCT at 3 mm (i.e. additional 3 to 4 sigmas)
    - What is the current required?
    - How far can we reduce the crossing angle with an optics 30/7.5 cm without crab cavities?
  - What could be configuration with an electron lens-type
  - End of February (Sasha)?
### Pending items with other work packages

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