

HL-LHC WP8 activities

**LCU meeting
22 Jan. 2013**

- HL-LHC WP8 COLLIDER-EXPERIMENTS INTERFACE aims at evaluate :
 - _ Constraints on beam pipe design for various options for the high luminosity insertions
 - _ Take into account physics requirements at IP
 - _ The fluence, dose rate & activation to be expected
 - _ The backgrounds and particle fluences induced in detectors for various operation modes
 - ➔ Coherent plan, finding the best compromise between both sides (experiments/machine) as soon as possible and should avoid “last minute” changes.
- 1st Workshop Collider-Experiments Interface was held on the 30th November 2012 :
 - _ Morning session : “desiderata” from the LHC experiments
 - _ Afternoon session : dedicated to to the technical requirements from the machine side
 - link : <https://indico.cern.ch/conferenceDisplay.py?confId=214361>
- Conclusion - Discussion – Potential Limitations & issues
 - _ Impedance and heating
 - _ Quality of vacuum – Requirement for a very good vacuum around ALICE.
 - _ Further collimators
 - _ Machine protection for crab cavities and larger TAS.
 - _ Radiation Protection issues
 - _ Remote handling & Engineering
 - _ Background and radiation from the machine in the experimental areas
 - _ *Key point : Consequences of new TAS geometry. Smaller smaller radii of the central beam-pipes and larger aperture of the TAS.*

- Topic :
 - _ *Work on integrated simulations, to allow to study and optimize optics, geometry, background and radiation within the Collider Experiment Interface Working Package 8 for the LHC high-luminosity upgrade HL-LHC, with a flexible description of the geometry of the interaction regions and beginning of arcs.*
- Key point : study the consequences of enlarging the TAS for the HL-LHC for background, radiation and protection of the central detector regions.
 - _ *Radiation Impact on the triplet/magnets : simulations using FLUKA (and/or DPMJET) for different machine configurations? Work done in close collaboration with the FLUKA team*
 - _ *detailed description of the apertures around the IR until beginning of arcs*
- Background studies :
 - _ *Beam-gas scattering, halo background studies using MADX, SixTrack and FLUKA (for beam/gas interactions description of the physical process)*
 - _ *Continuation, follow up of work started by Y. Levinsen and R. Bruce*
- First objective & starting point : obtain a clear picture of the beam pipe geometry modifications and work on their implementation in simulation tools (e.g. MADX aperture file....)
 - _ *Then, establish a model pattern and combine code results. Possibility of benchmarking with LHC ?*