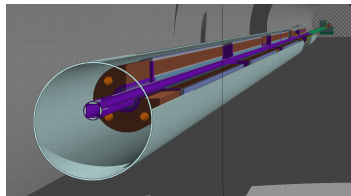


Simulation priorities until end of 2015 (Task 5.3)

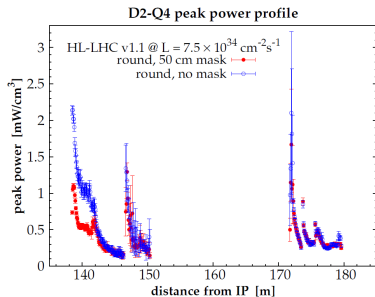
A. Lechner, R. Bruce, F. Cerutti, E.S. Esposito, R. Kwee-Hinzmann,
S. Redaelli, N.V. Shetty, E. Skordis

4th Joint HiLumi LHC-LARP Annual Meeting
Nov. 20th, 2014



Ongoing (L.S Esposito et al.):

- WP10 studies (pp collision debris) are ongoing for TCLs/masks in matching section



IR2 & IR1/5: DS collimators for heavy-ion operation

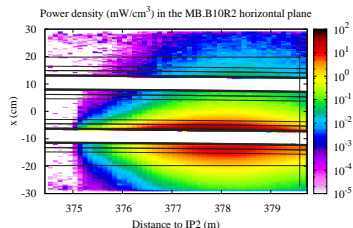
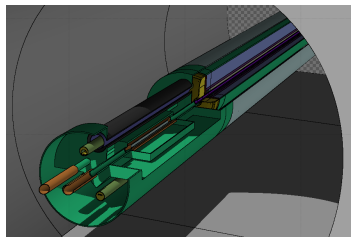
Previous studies (G. Steele et al.):

- comparative study for secondary beams originating in IP2 (BFPP1): energy deposition in the DS with and without TCLDs (embedded between 11T magnets)

→ results have been presented at 2013 Coll Review (G. Steele et al.) and at the 3rd Annual HiLumi Meeting/Daresbury (A. Lechner et al.)

Foreseen studies (**short term**):

- similar comparison (no TCLD vs TCLD) for BFPP1 products from IR1/5
→ *ion distribution already provided by M. Schaumann (still to be mapped from magnet front face to beam screen)*
- spreading out the spatial impact distribution by means of orbit bumps (IR2/1/5)
→ *ion distribution under preparation by M. Schaumann*



IR7 & IR1/5: DS collimators for proton operation

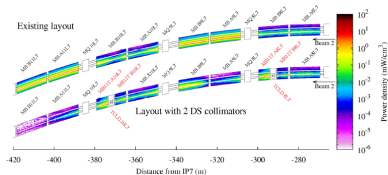
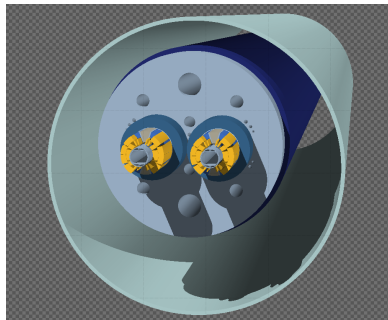
Previous studies (G. Steele&E. Skordis et al.):

- **proton collimation leakage: energy deposition in the DS next to IR7 with and without TCLDs in cells 8 and 10 (embedded between 11T magnets)**

→ results have been presented at the 3rd Annual HiLumi Meeting/Daresbury (A. Lechner et al.) and at IPAC14 (A. Lechner et al., <http://accelconf.web.cern.ch/AccelConf/IPAC2014/papers/mopro021.pdf>)

Potential studies (**long term**):

- proton collision debris in IR1/5: effect of TCLD introduced at a position beneficial for ion operation
→ *could be done within WP10 studies once the IR collimation layout is more finalized*



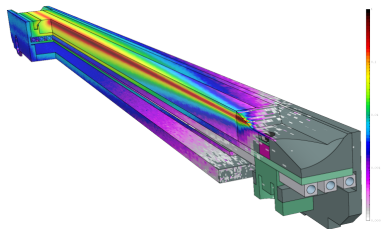
Accidental beam impact on collimators (energy deposition in jaws themselves)

Prev. studies (E. Skordis&A. Patapenka et al.):

- beam impact on TCSG, TCSP and TCSX due to injection failures (288 bunches at 450 GeV, round beams), considering different TCSX tapering, frames and absorber materials
- beam impact on TCSP (in IR6) due to dump failure (realistic sweep)
- beam impact on TCTP (with wire) due to dump failure
- beam impact on TCT due to dump failure (bunch-by-bunch)

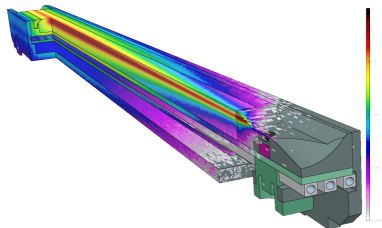
Potential studies (**short-to-mid term**):

- further iterations for TCSX if needed



Planned (**short-to-mid term**):

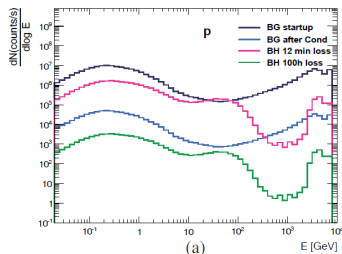
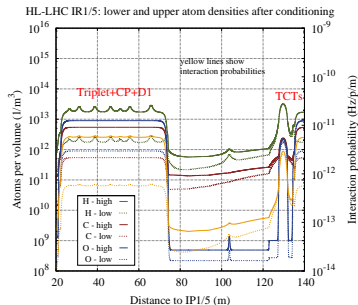
- Load on triplet after beam impact on TCT during an asynchronous beam dump
→ *studies planned for present machine, input from SixTrack readily available (collimation team)*
→ shall we also envisage some simulations for HL layout?



IR1/5: background to experiments (1/2)

Previous studies (N.V. Shetty & R.Kwee-Hinzmann et al.):

- **gas-induced background, considering beam-gas collisions up to D1**
 - **background due to halo impact on TCT4**
- studies restricted to round beams, using a preliminary layout from autumn 2013 (TAN aperture, triplet beam screen etc. have changed meanwhile)
- very preliminary gas pressure profile
- results have been provided to experiments for further simulations (<http://bbgen.web.cern.ch/bbgen/hl-lhc/index.html>)
- IR1 results have been presented at the 3rd Annual HiLumi Meeting/Daresbury and at IPAC14 (R. Kwee-Hinzmann et al., <http://accelconf.web.cern.ch/AccelConf/IPAC2014/papers/tupro027.pdf>)



Foreseen studies (short-to-medium term):

- comparative study of halo-induced background: TCT4 vs TCT4+TCT5
 → will rediscuss timeline after the annual meeting (shall we wait for a more final layout?)
 → *input from SixTrack readily available (R. Kwee-Hinzmann et al.)*

Potential further studies (longer term):

- gas-induced background up to arc (muon background), using the final IR layout
 → *requires updated gas profile, which extends further than D1 (vacuum team)*
- other beams than round ones?
 → maybe we should look at Sixtrack results first and then decide if it is worth running shower simulations

