

WP14 Meeting: Status LBDS Upgrade Studies and HL-LHC Annual Meeting

Participants: Antonio, Anton, Valeria, Yann, Francois-Xavier, Chiara

Main outcome and actions:

Need final solutions for TCDQ and TCDS upgrade by end 2020

TCDQ and TCDS:

- Not enough knowledge about 2D CFC characterisation (contact company), **check if 3DCC for critical blocks is good enough (F.-X. Nuiry)**. Consider that for HL-LHC, minimum TCDQ gap = 3 mm (for beam 2, including 1 mm tolerances) and likelihood of type2 erratic drastically reduced by upgrade.
- The plastic deformation of the order of 200 um on the TCDS Ti block will not have any impact on operation or provided protection.
- **Optimum TCDS sandwich structure** performing FLUKA simulations considering all **15 MSD**, ask J. Borburgh for field maps (**V. Rizzoglio** and **A. Lechner**)
- **Energy deposition on all TCDQ downstream elements** (TCSP pick-ups, TCDQM, Q4 and Q5) coming from halo cleaning and asynchronous beam dump (**V. Rizzoglio** and **A. Lechner**)
- **Bunch distribution for different failure cases at TCDQ and TCDS (Y. Dutheil)**
- Optics: all studies now performed with beam sizes as calculated using optics version HLLHCV1.3 with an additional margin on top of it (10% smaller beam size in both planes, **C. Bracco** will define that in functional specs) to allow for minor modifications (small differences observed between V1.3 and V1.4). in general Beam 2 more critical since smaller beta, gap, right after IR7 and before CMS...
- Functional specs for TCDS and TCDQ available in SharePoint
<https://espace.cern.ch/HiLumi/WP14/Shared%20Documents/Forms/AllItems.aspx>

TDE:

- Wait for **C&S review and decision on number of dilution kickers** to finally write functional specifications with final configuration (6 MKBH, re-triggering, etc.). A higher number of kickers reduces the risk of failure and the effect on the dilution pattern
- Possibility of **increasing beta function at upstream window excluded**
- For the moment **consider nominal dilution pattern**
- Need to study **survival of TCDD (V. Rizzoglio and A. Lechner)**
- What would the **effect of no dilution on windows?** Bunch pattern taking into account MKD overshoot (STI)

Open questions:

- Likelihood of failures, student working on that, numbers available by the end of the year

HL-LHC annual meeting. Three talks for WP14:

- Valeria: "Update on energy deposition studies for the beam dump"
- Anton: "Energy deposition in IR6 magnets during regular an irregular beam losses"
- Chiara: plenary talk "Highlights and new challenges for WP14":
 - MKI-cool and TDIS ready for installation in LS2 (I'll ask for many nice pictures)

- Summary of more recent studies etc....(I'll take inspiration from your talks, all well referenced!)