Update of functional specifications for HL-LHC IR collimators

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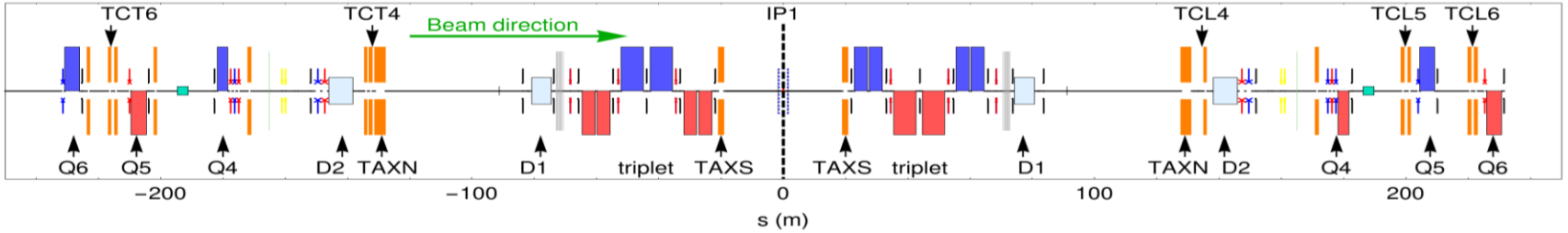
History of specs

- Two functional specifications under discussion
  - Tertiary collimators (TCT*): EDMS **2519805**
    - Working draft, soon to be circulated on EDMS: https://cernbox.cern.ch/s/cnEtYbcodQFFGZv
  - Physics debris collimation (TCL*): EDMS **2276600**
    - Working draft, soon to be circulated on EDMS: https://cernbox.cern.ch/s/DyjVPWVzlTFwBJq
    - Including both fixed masks and movable collimators
- Last versions circulated last summer
- Since then, a steady flow of updates and additions
  - not possible to finalize them directly
- Now, new versions prepared including the latest developments
  - To be circulated again shortly

Overview of IR collimators



- Tertiary collimators on incoming beam
  - Pair of TCTs in cell 6 (TCTP)
    - Present baseline is to re-use these ones from LHC TCTs or LHC spares
  - Pair of TCTs in cell 4 (special “X-series”, 2-in-1 design including beam pipe of the non-collimated beam – TCTPXH, TCTPXV)
- Physics debris collimators and masks on outgoing beam
  - X-series TCL in cell 4 (TCLPX), standard collimators in cells 5 and 6 (TCLP)
    - Newly built collimators
  - Fixed masks in cells 4,5,6 (TCLM)

Main changes since last versions

- Material choice of horizontal TCTs
  - Inermet180 confirmed, not CuCD
- Updated baseline: reusing existing LHC TCTs and spares for cell 6
  - Use newly built collimators with RF fingers for TCLs that have smaller gaps; use existing collimators with ferrites for TCTs
- Updated design of TCLM
  - Geometric shape for optimizing aperture and protection, in close collaboration with WP2 and WP10
  - Using Cu on incoming beam, Inermet180 on outgoing beam
  - Cu inner pipe
- Coating: aC or NEG on external pipe of non-collimated beam in TCTPX and TCLPX
- Added table with geometric constraints prepared by WP2
- Updated beam-induced heat loads and jaw deformations in separate EDMS documents
- Harmonization of tables
- A number of minor updates