

“Collimation Update” talk at the LHC Performance Workshop, Chamonix 2018

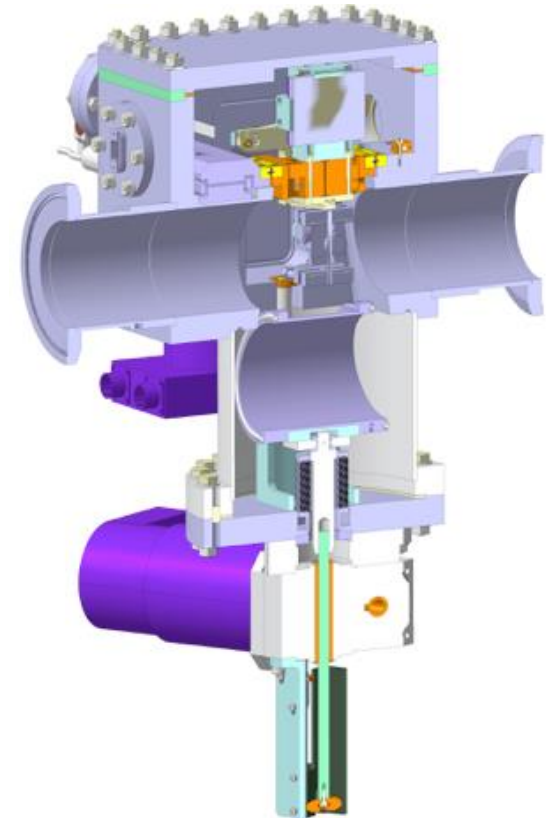
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for the collimation team



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Present implementation

- ★ Replacement chamber hides the gonio/crystal assembly from high intensity beams
 - No beam permit for in-beam position, masked for setup beam intensities.
- ★ Adequate for the important feasibility studies carried out so far:
 - First demonstration of channeling
 - Assessment of collimation cleaning
 - Various species: p, Pb, Xe
 - Operational aspects: energy ramp
 - Even impedance, with single nominals.
- ★ The operational efficiency was severely affected by the MP constraint, but we could survive without more complex software implementations.
- ★ Need more for the important tests with Pb ions in 2018!



Plans for 2018

- ★ Results with Xe beam very promising: improved by $>10x$ losses in the dispersion suppressor dipoles compared to the present system!
 - We want to **confirm this with Pb beam** and **study experimentally** in 2018 if crystal collimation could be used for HL-LHC. Thus, need to explore scenarios beyond setup limit!
 - Strong motivation in light of the operation in Run III with 1 collimator in the dispersion suppressor.
- ★ We will have 4 crystals — 1 per beam per plane: can potentially make exhaustive tests for a complete system!
 - Test as EoF after a physics run;
 - Ideally, even plan some tests during intensity ramp up!
- ★ **New interlock specifications in a nutshell.**
 - Must have beam permit when replacement chamber is IN
 - Maintain separated channel for other collimators, which will be used to catch channeled halo;
 - Dump if one accidentally moved the chamber with beam

Remarks

- ✦ From the project side, we request this implementation for 2018, ideally for tests in the checkout
 - Deployment during a technical stop also feasible.
- ✦ Detailed MD program is not yet subject of this panel and will be worked out for approval to the pertinent bodies first.
 - Hopefully, endorsement by MD team to be followed by detailed preparation at CWG + MPP!
- ✦ Examples:
 - Detailed operational conditions
 - Setting and procedures for collimators downstream of crystals
 - Safe limits for channeled halo intensity impinging on CFC and W collimators of IR7.