

# MD #14363: Off-Momentum Beam Loss Patterns with Ions

LSWG on 2024 Ion MD

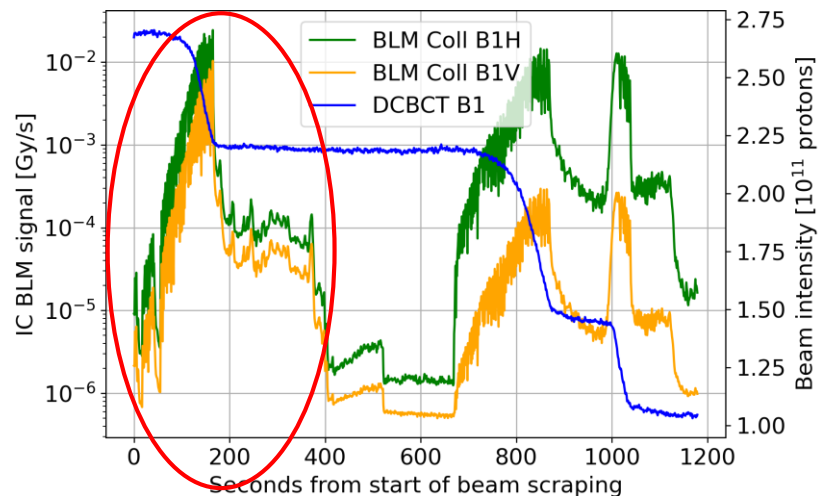
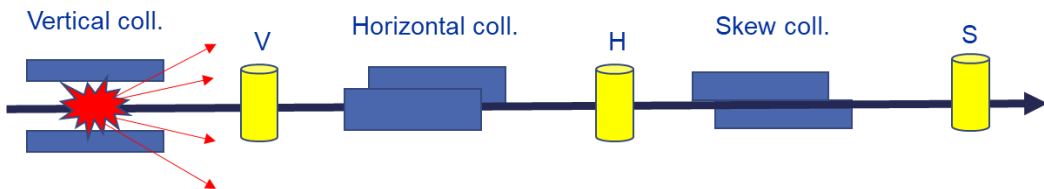
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Recap on calibration of the BLM system (Gy/s to protons/s)

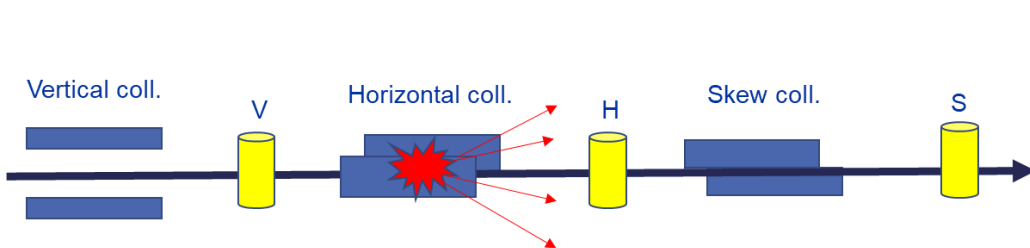
- Based on the analysis of the BLM detector signals for different well-defined beam loss scenarios
- Proton impacts on the jaws of the primary B1 and B2 betatron and off-momentum collimators
- Beam loss scenarios reproduced by controlled beam scraping on single collimators
- To be repeated after every change in settings or long technical stop



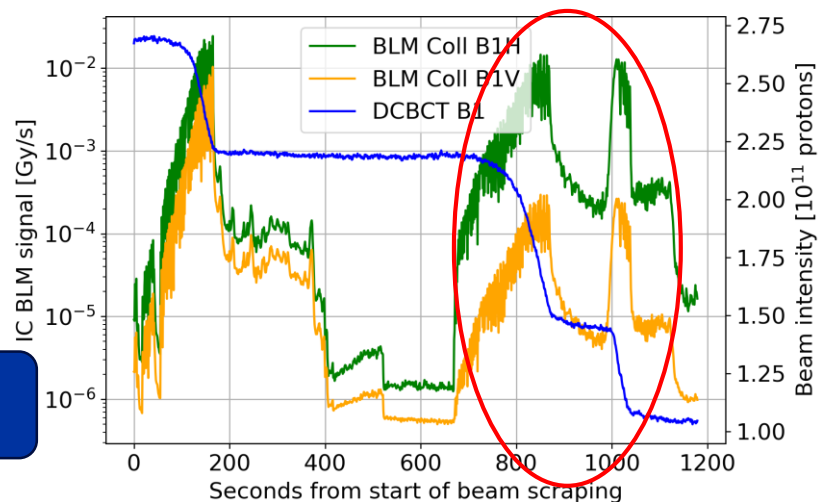
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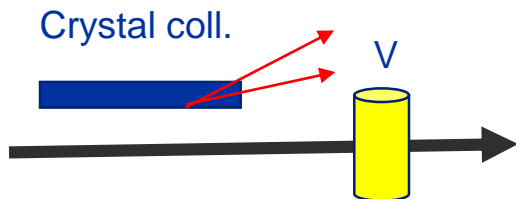
Scraping exercise done with protons at injection and top energy!



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## Calibration of the BLM system (Gy/s to ions/s)

- Based on the analysis of the BLM detector signals for different well-defined beam loss scenarios
  - **Crystal collimator acting as primaries -> Completely different loss patterns!**
- Ion impacts on the jaws of the primary B1 and B2 off-momentum collimators in IP3
- Ion losses from crystal collimation in IP7
- Beam loss scenarios reproduced by controlled beam scraping on single collimators



First scraping exercise with crystal collimation done last year, only at top energy:

- Required many hours for each configuration

This year, the MD time is limited:

- Agreed to obtain BLM responses in IR7 from loss maps, but still need dedicated scraping for IR3 at injection energy for start of ramp losses!

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- Injection of 20 nominals per beam (to stay below SBF) and stay at injection energy
- BIC mask collimators, BLMs and BPMs
- BLM thresholds remain at the nominal settings in all the machine
- Beam scraping with primary collimators in IR3 (off-momentum)
  - First with both jaws, then repeat only with left jaw, and repeat only with right jaw
  - Assess changes on BLM response, include in calibration
- After the MD...
  - Play nominal sequences to recover collimator settings
  - Remove BIC masks on collimators, BLMs and BPMs
- One session of around 3 hours, can be combined with another BI MD into an 8-hour block
  - If there is time and beam left at top energy, it would be interesting to repeat the scraping exercise in IR3 at top energy

