

MD9546 - B1

Collimation Quench

Test with Protons

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rMPP meeting on MD Block 5 (2024) approval

Objective: Induce high losses at the IR7 TCP by increasing power load to quench the DS magnets with collimation debris.

- Aim: Infer the power load at the TCP that causes DS magnets to quench under operational conditions.
- Importance: Provides key data to determine the need for installing 11T dipoles.

Previous Findings

- Data from a 2022 collimation quench test using B2.
- Results: Magnet coil power deposition within the middle range of expected HL-LHC power deposition was tolerable.
- Limitation: The upper end of the expected HL-LHC power deposition range was not reached.

Current MD Goals

- Test the quench limit on the opposite side of IR7.
- Build on experience from the first MD to achieve higher loss rates and coil power deposition.
- Strengthen insights into the operational quench limit to inform HL-LHC collimation system upgrades.

Building on previous experience...



CERN-ACC-NOTE-2023-XXX MD

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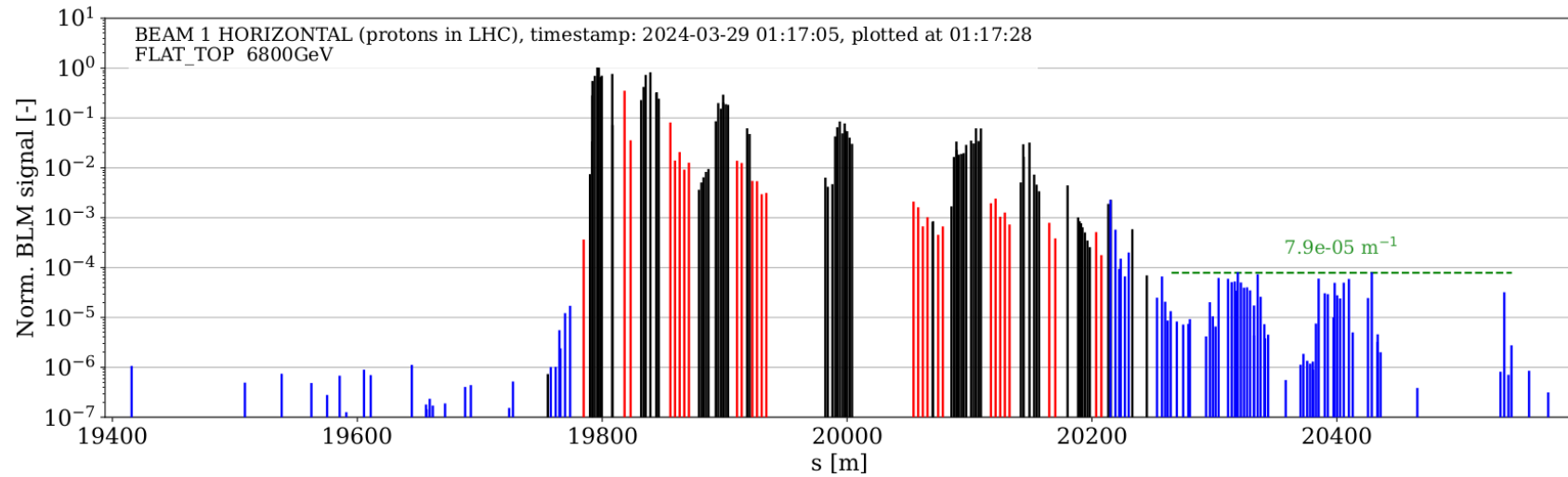
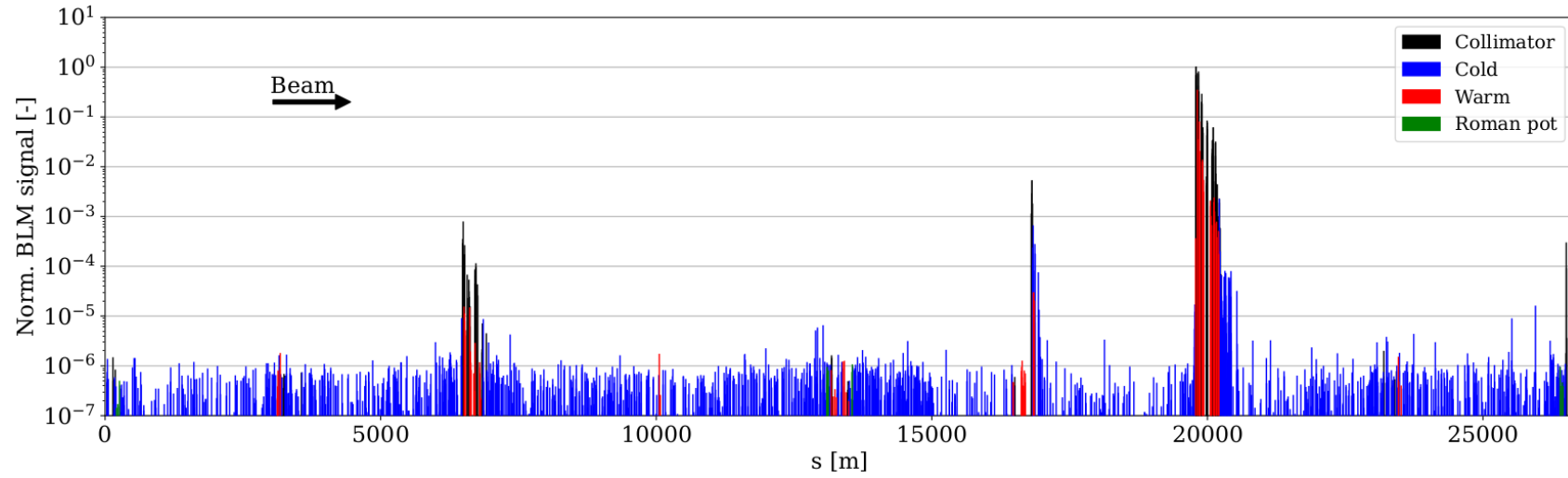
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MD 7224: LHC collimation quench test with protons

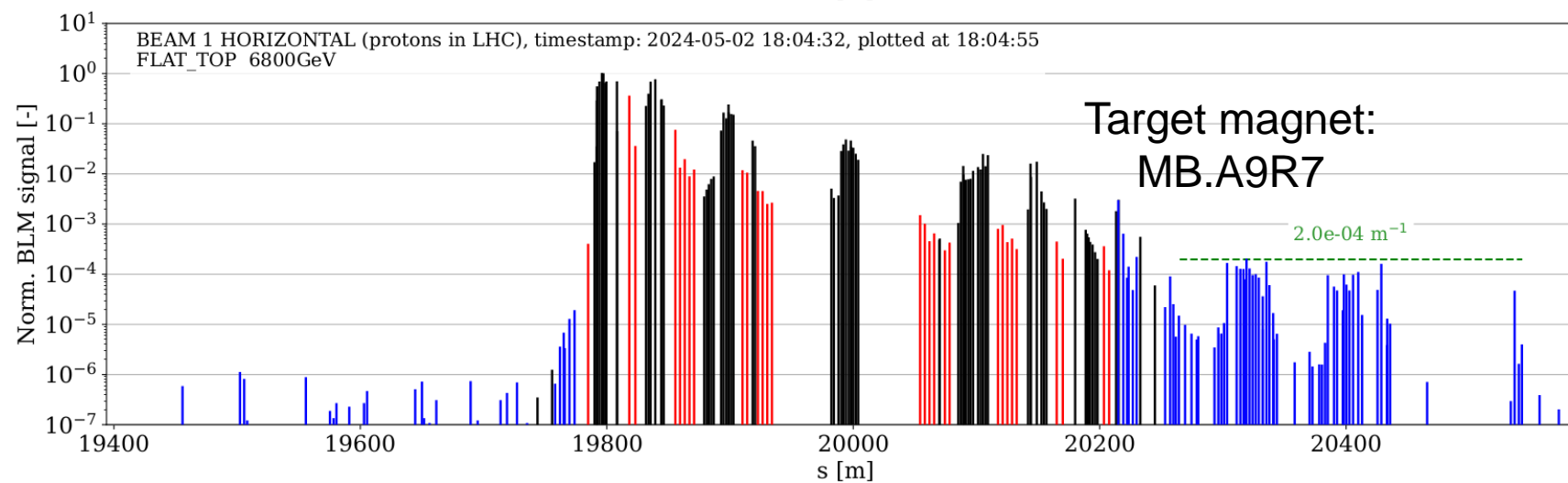
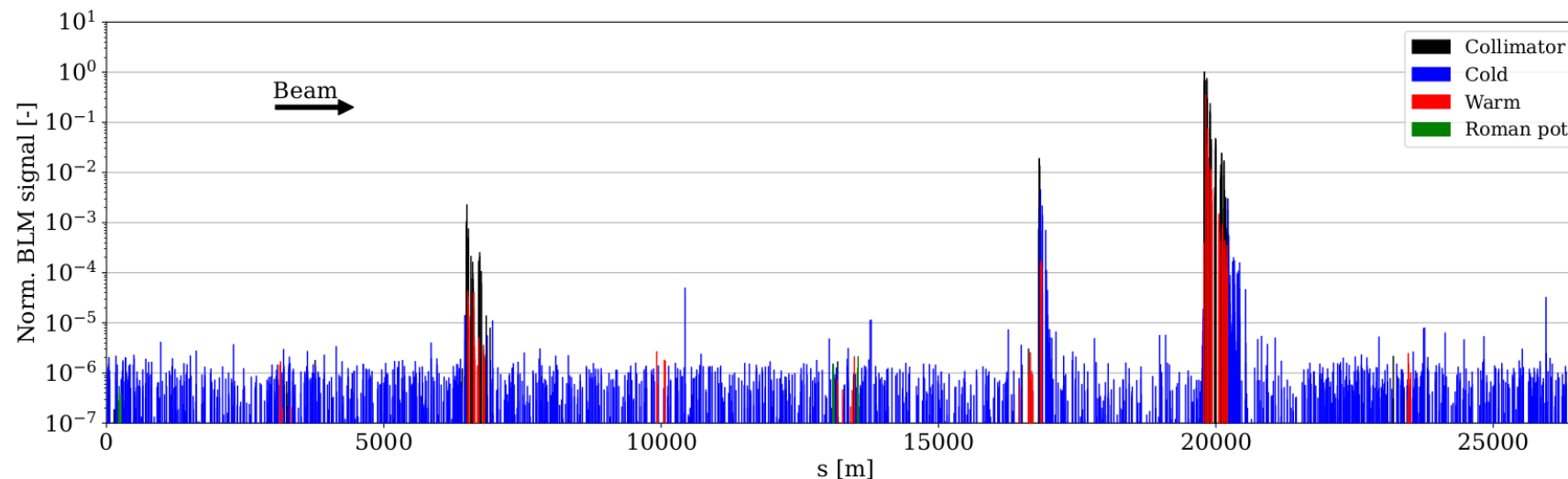
P. Hermes, A. Abramov, R. Bruce, D. Calzolari, M. D'Andrea,
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Salvachua, M. Soderen, J. Uythoven, D. Valuch, C. Wiesner, D. Wollmann,
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Keywords: LHC, Collimation system, Main dipoles Quench Limit, ADT, BLM system

Nominal B1H lossmap (Secondaries at 6.5 sigma)

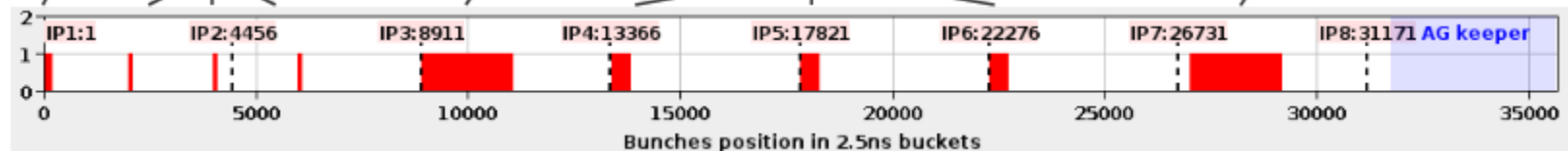


Relaxed B1H lossmap (Secondaries at 8.5 sigma)



Further notes on the MD procedure

- All details here (to be moved in ASM!)
https://codimd.web.cern.ch/Ktx-Tg4HQnS5jL_opklzCw#
- Symmetric fashion to MD7224
- Replicate filling scheme/procedure/strategies (e.g. dedicated filling scheme with two attempts per fill)



- To be done: review of BLM threshold with BLMTWG