Contribution ID: **185** Contribution code: **TUP068** Type: **Poster Presentation**

Mu2e Resonant Extraction Regulation System Simulation in Delivery Ring

Tuesday 12 August 2025 16:00 (2 hours)

Mu2e is an upcoming experiment at Fermilab that relies on the slowly extracted 8 GeV proton beam from the Delivery Ring. The experiment imposes strong requirements on the spill uniformity. To address these requirements, the fast spill regulations system is being developed and commissioned. To inform this development and optimize the system performance we are carrying out the detailed simulations of the regulation process. The simulation is done in XSuite with DR lattice, including six harmonic sextupoles that excite the third-integer resonance and three fast ramping quadrupoles that drive the horizontal tune to 29/3. The components of spill regulation system are designed to mitigate long-term drifts in the beam, ensuring stable operation over extended timescales, as well as addresses rapid variations within single spill. The study also explores the role of RF Knockout (RFKO) in spill control, with a focus on characterizing its various features, including frequency modulation, amplitude optimization, and their impact on beam dynamics. The simulations evaluate the effects of these controls on phase-space evolution and overall system stability under varying operational conditions.

Please consider my poster for contributed oral presentation

Yes

Would you like to submit this poster in student poster session on Sunday (August 10th)

Yes

Footnotes

Funding Agency

Fermi Forward Discovery Group, LLC

I have read and accept the Privacy Policy Statement

Yes

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