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Type: Poster Presentation

Mu2e Resonant Extraction Regulation System Simulation in Delivery Ring

Sunday 10 August 2025 15:00 (3 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 includes the effect of 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. In this study, we review the regulation system design, simulation of the slow regulation, and the fast regulation PID regulation to curtail random variations in the extraction rate that could occur within a single spill.

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

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Yes

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