Contribution ID: **478** Contribution code: **MOP039** Type: **Poster Presentation**

Fast adaptive neural control of resonant extraction at Fermilab

Monday 11 August 2025 16:00 (2 hours)

We present the development of a machine learning (ML) regulation system for third-order resonant beam extraction in the Mu2e experiment at Fermilab. Classical and ML-based controllers have been optimized using semi-analytic simulations and evaluated in terms of regulation performance and training efficiency. We compare several controller architectures and discuss the integration of neural control into an adaptive framework. In addition, we report progress on implementing low-latency, edge-based inference to enable deployment in hardware-constrained environments. This work demonstrates the feasibility and potential advantages of ML-based control for regulating complex, non-stationary systems, with applications extending beyond resonant extraction.

Please consider my poster for contributed oral presentation

No

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

No

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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