Contribution ID: **492** Contribution code: **MOP037** Type: **Poster Presentation**

Calculating beam extinction in a pulsed proton beam using FPGA-based peak detection

Monday 11 August 2025 16:00 (2 hours)

The Mu2e experiment at Fermilab imposes stringent requirements on the elimination of out-of-time beam in its pulsed proton beam, a requirement known as "extinction". Utilizing a new µTCA-based FPGA data acquisition system, we recorded live particle data from scattered particles incident on an array of quartz Cherenkov radiators and photomultiplier tubes to measure the extinction in the inter-pulse gaps in the pulsed proton beam. Minuscule errors in the derived signal period can make a measurement of the extinction impossible, so after taking a Fourier transform, further optimizations on the period were done based on the assumption that the signal period is stable over the full time of the beam spill while it is being resonantly extracted. After these optimizations, the beam extinction was shown to be on the level of 10^3.

Please consider my poster for contributed oral presentation

No

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

Yes

Footnotes

Funding Agency

Department of Energy grant DE-SC0009999

I have read and accept the Privacy Policy Statement

Yes

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