



Contribution ID: 984 Contribution code: WEPR74

Type: **Poster Presentation**

## Electron cloud simulations in the Fermilab booster using PyELOUD

*Wednesday, 22 May 2024 16:00 (2 hours)*

As part of Fermilab's Proton Improvement Plan-II (PIP-II), the Fermilab Booster synchrotron will operate at a higher intensity, increasing from  $4.5 \times 10^{12}$  to  $6.7 \times 10^{12}$  protons per pulse. A potential challenge for achieving high-intensity performance arises from rapid transverse instabilities induced by electron clouds (EC). This research presents electron cloud simulations using PyELOUD, which is an advanced computational tool that incorporates measurements of the secondary electron yield (SEY) from the Booster's combined function magnet material. By systematically varying beam parameters in PyELOUD, such as bunch structure, bunch length, and intensity, the EC effects on beam stability and overall performance of Booster can be predicted.

### Footnotes

### Funding Agency

This manuscript has been authored by Fermi Research Alliance, LLC under Contract No. DE-AC02-07CH11359 with the U.S. Department of Energy, Office of Science, Office of High Energy Physics.

### Paper preparation format

Word

### Region represented

North America

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**Session Classification:** Wednesday Poster Session

**Track Classification:** MC5: Beam Dynamics and EM Fields: MC5.D12 Electron Cloud and Trapped Ion Effects