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# Dynamic Aperture Studies at the Fermilab Recycler Ring

*Tuesday 12 August 2025 16:00 (2 hours)*

As part of the Proton Improvement Plan II (PIP-II), Fermilab aims to increase beam intensity delivered to neutrino experiments. In this context, higher intensity injection into the Recycler Ring enhances space charge effects, pushing operations closer to third-order resonances. These resonances reduce the Dynamic Aperture (DA), leading to increased beam loss. This study presents simulations of DA as a function of tune in the Recycler Ring, incorporating chaos indicators such as the Reversibility Error Method (REM) and Frequency Map Analysis (FMA). The effectiveness of existing resonance mitigation strategies is evaluated by quantifying their ability to delay DA degradation. Additionally, the study examines how space charge detuning and DA limitations dictate viable operational tune points for the Recycler Ring.

## Please consider my poster for contributed oral presentation

Yes

## 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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