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## Phase space control of transverse resonance island buckets at CESR

*Wednesday, 10 May 2023 16:30 (2 hours)*

Transverse resonance island buckets (TRIBs) have been successfully observed at the Cornell Electron Storage Ring (CESR) after optimizing the distribution of seventy-six sextupoles to achieve the desired amplitude-dependent tune shift and the resonant driving term near a third-order resonant line ( $3\nu_x=2$ ). A novel knob is created to adjust the resonant driving term  $h_{22000}$  while minimizing the change of  $h_{30000}$ . Interestingly found from simulation, the knob can change the TRIBs locations in the phase space, which is then confirmed experimentally at CESR. Theoretical calculation of the fixed points (stable and unstable) in the phase plots are explored with PTC, which shows excellent agreement with the tracking results and provides theoretical understanding of the TRIBs in the phase space. In addition, the island locations in the real x-y space are explored by adjusting a skew quadrupole to change the x-y coupling.

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### Footnotes

### I have read and accept the Privacy Policy Statement

Yes

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