Contribution ID: **2053** Contribution code: **TUPS109** Type: **Poster Presentation**

Wakefields in an elliptical cavity and alternating-structure stability analyses

Tuesday 3 June 2025 16:00 (2 hours)

We present the analytical solution for the transverse and longitudinal wakefields in a perfectly conducting elliptical cavity following from a conformal mapping formalism. These closed-form results are corroborated by numerical calculations. Simple representations of the dipole and quadrupole modes as a function of the cavity dimensions then precipitate, permitting the analyses of the beam tail's emittance preservation and BNS damping in an alternating structure. We then consider general forms for the dipole and quadrupole components as functions of the longitudinal coordinate and determine what perturbations to such a structure may improve stability.

Footnotes

Paper preparation format

LaTeX

Region represented

America

Funding Agency

This research is supported by the Center for Bright Beams, U.S. National Science Foundation grant PHY-1549132.

Authors: MANN, Joshua (University of California, Los Angeles); LYNN, Walter (University of California, Los Angeles); ANDONIAN, Gerard (University of California, Los Angeles); ROSENZWEIG, James (University of California, Los Angeles)

Presenter: MANN, Joshua (University of California, Los Angeles)

Session Classification: Tuesday Poster Session

Track Classification: MC3: Novel Particle Sources and Acceleration Techniques: MC3.A16 Advanced Concepts