Contribution ID: **2528** Contribution code: **WEPA085** Type: **Poster Presentation**

Hellweg improvements for 3D traveling wave linac design with beam loading

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

The industrial, medical and homeland security markets for low-to-moderate energy electron linacs are growing rapidly, often requiring beam currents that strongly load the accelerating fields. The two-beam accelerator (TBA) is one concept for the structure wakefield acceleration approach to an electron-positron collider. Transient beam loading effects are a significant challenge for the drive beam in a TBA structure, where energy droop in high-charge bunch trains must be understood and compensated. The Hellweg code accurately models steady state beam loading for traveling wave RF structures with a fast reduced model. The Hellweg equations of motion have recently been generalized to include arbitrary charge-to-mass ratio and to use momentum as the dynamical variable. These and other recent developments are discussed, including a new browser-based GUI. Proposed future developments include support of standing wave RF structures and transient beam loading effects.

Funding Agency

This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of High Energy Physics, under Award # DE-SC0022799.

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: POGORELOV, Ilya (RadiaSoft LLC)

Co-authors: BRUHWILER, David (RadiaSoft LLC); CARLIN, Evan (RadiaSoft LLC); EIDELMAN, Yury (Eidelman's Scientific Consulting); KUTSAEV, Sergey (RadiaBeam); MOELLER, Paul (RadiaSoft LLC); NAGLER, Robert (RadiaSoft LLC); SUGARBAKER, Garret (RadiaSoft LLC)

Presenter: KUTSAEV, Sergey (RadiaBeam)

Session Classification: Wednesday Poster Session

Track Classification: MC5: Beam Dynamics and EM Fields: MC5.D11: Code Developments and Simulation Techniques