



Contribution ID: 613 Contribution code: TUPM008

Type: **Poster Presentation**

Electromagnetic and beam dynamics modeling of the LANSCE coupled-cavity linac with CST studio

Tuesday, 9 May 2023 16:30 (2 hours)

The 800-MeV proton linac at the Los Alamos Neutron Science Center (LANSCE) includes a drift-tube linac, which brings the beam to 100 MeV, followed by a coupled-cavity linac (CCL) consisting of 44 modules. Each CCL module contains multiple tanks, and it is fed by a single 805-MHz klystron. CCL tanks are multi-cell blocks of identical re-entrant side-coupled cavities, which are followed by drifts with magnetic quadrupole doublets. Bridge couplers –special cavities displaced from the beam axis –electromagnetically couple CCL tanks over such drifts. We have developed 3D CST models of CCL tanks. The RF fields in the tanks are calculated with MicroWave Studio, and magnetic fields of quadrupole doublets are found with ElectroMagnetic Studio. Beam dynamics is modeled with Particle Studio for bunch trains with realistic beam distributions using the CST calculated fields to determine the output beam parameters. Beam dynamics results are compared with other multi-particle codes and provide data for training physics-based surrogate models.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

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Session Classification: Tuesday Poster Session

Track Classification: MC4: Hadron Accelerators: MC4.A08: Linear Accelerators