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Online multi-particle model for LANSCE physics tune-up with HPSim

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At the Los Alamos Neutron Science Center (LANSCE), the accelerator operation is loss-dominated, and the losses are primarily minimized via operators'intuition. The physics tune-up procedures for the linac, including the Drift Tube Linac (DTL) and the Side-Coupled Cavity Linac (CCL), does not take the bunch distribution into consideration. For the DTL, only statistical quantities like the full width half maximum are considered but not the whole phase scan distributions. For the CCL, a single particle model is used. In this work, we demonstrate an improved tuning tool to incorporate the simulated bunch distribution via the multi-particle High-Performance Simulator (HPSim) for the physicists to monitor the bunch distribution and losses during the tune-up process.

Footnotes

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