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## Simulation of the LANSCE PSR injection and extraction beam lines

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The Los Alamos Neutron Science Center (LANSCE) accelerator delivers high intensity proton beams for fundamental science and national security experiments since 1972. The Proton Storage Ring (PSR) accumulates a full 625-us macro-pulse of proton beam and compresses it into a 290-ns long pulse, delivering an intense beam pulse to the Lujan Neutron Science target. The proposed LANSCE Modernization Project (LAMP) is evaluating necessary upgrades to the accelerator that will guarantee continuous beam operations in the next decades. Upgrades to the PSR and its high-energy injection and extraction beamlines are being considered to handle the higher beam intensity enabled by the LAMP upgrades in the front-end. For the PSR upgrades studies, we are building models of the PSR injection and extraction lines in codes which include space charge calculations like Elegant and Impact. These better illustrate the beam dispersion and the beam halo in the high-energy transport. This work describes the LANSCE PSR injection and extraction lines and the corresponding simulation models. The models are compared to available beam diagnostics data where available.

### Footnotes

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**Primary author:** Dr SOSA, Salvador (Los Alamos National Laboratory)

**Co-authors:** TAYLOR, Charles (Los Alamos National Laboratory); HENESTROZA, Enrique (Los Alamos National Laboratory); DALE, Gregory (Los Alamos National Laboratory); UPADHYAY, Janardan (Los Alamos National Laboratory); LEWELLEN, John (Los Alamos National Laboratory); BARRAZA, Juan (Los Alamos National Laboratory)

**Presenter:** Dr SOSA, Salvador (Los Alamos National Laboratory)

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