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Monte Carlo estimation of emittance growth during injection into the LANSCE PSR

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The Los Alamos Neutron Science Center (LANSCE) accelerator uses charge exchange injection to accumulate a high-intensity proton beam in the Proton Storage Ring (PSR). H⁻ ions are accelerated to 800 MeV and then stripped of their electrons when they pass through a thin foil at the ring injection site. Various parameters, such as foil thickness, density and chemical composition, effect the performance of stripper foils, and foils are engineered to maximize charge exchange efficiency and foil lifetime while minimizing beam loss and emittance growth during injection. A model of the stripper foil has been created using a Monte Carlo radiation transport code as part of the conceptual design for a PSR upgrade. The model will be used to optimize the foil and estimate parameters of the ion beam after injection. Preliminary results for the emittance growth of the injected beam are presented for a range of foil parameters.

Footnotes

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North America

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