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Storage Ring (PSR)

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Calculations and Observations of the Longitudinal Instability Caused by the Ferrite Inductors at the Los Alamos Proton Storage Ring (PSR) *

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The frequency dependence of the complex permeability of the ferrite (at room temperature) used in the Inductors at PSR have been determined by comparing the S_{11} parameters of a jig containing a ferrite core, and a MAFIA simulation of the jig. Both the resonance frequency and the longitudinal impedance of the inductor were obtained by simulating the inductor cavity in MAFIA. Experimental observations of the longitudinal instability caused by the ferrite inductors at room temperature for both DC Coasting beams and Bunched Coasting beams at a variety of intensities have been conducted. Comparisons of observed and calculated growth times, thresholds, resonant frequencies, and width of the instability will be discussed.

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