

Electron cloud generation, trapping and ejection from quadrupoles at the Los Alamos PSR

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Since the ECLOUD'07 workshop, our electron cloud studies have focused on understanding the main sources and locations of electron clouds (EC), which drive the observed e-p instability. Significant EC signals are observed in drift spaces and quadrupole magnets at PSR which together cover ~65% of the ring circumference. Measurements using the EC diagnostic in a quadrupole have also shown significant trapping of electrons in the quadrupole well after the beam is extracted. Results making use of two longitudinal barriers to isolate the drift space electron diagnostic have provided definitive evidence that most of the drift space EC signal is "seeded" by electrons ejected longitudinally by ExB drifts from adjacent quadrupole magnets. Modeling of EC generation in 3D quadrupoles using a modified version of the POSINST code shows that a sizeable fraction of the electrons generated in the quadrupoles are ejected longitudinally into the adjacent drifts. The experimental findings and simulation results of this focus will be presented.

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