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Energetic Electron Pitch Angle Scattering Experiments at the NRL SPSC[1] CHRISTOPHER COTHRAN, Sotera Defense Solutions, ERIK TEJERO, WILLIAM AMATUCCI, U. S. Naval Research Laboratory — Cyclotron resonance of whistler waves with electrons, leading to pitch angle diffusion into the loss cone, is thought to be an important mechanism for depleting energetic electron populations in the radiation belts. Laboratory experiments in progress in the Space Physics Simulation Chamber (SPSC) at the U.S. Naval Research Laboratory (NRL) are attempting to observe and characterize this process. A pulsed RF plasma source developed specifically for these experiments produces high ionization fraction plasmas at densities near $10^{10}/\mathrm{cm}^3$ in half mirror, full mirror, and uniform magnetic field geometries. Whistlers are driven by a helicon antenna, separate from that used for the plasma source, and interact in a 3m uniform field region with an energetic electron beam. The beam can be steered magnetically to adjust the pitch angle, and can be operated in CW or pulsed mode at up to 5keV and 80mA. Results of gridded energy analyzer measurements of the energetic electron populations will be reported.

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