Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Nonlinear Generation of Electromagnetic Waves Through Induced Scattering by Thermal Electrons[1] ERIK TEJERO, CHRIS CRABTREE, DAVID BLACKWELL, BILL AMATUCCI, MANISH MITHAIWALA, GURU GANGULI, Naval Research Lab, LEONID RUDAKOV, Icarus Research Inc
— Nonlinear interactions involving whistler wave turbulence are important contributors to radiation belt dynamics. Given sufficient whistler energy density, nonlinear scattering from thermal electrons can substantially change the wave normal angle, while inducing a small frequency shift. This nonlinear process is being studied in the NRL Space Physics Simulation Chamber (SPSC) in scaled magnetospheric conditions. Experiments conducted in the SPSC have demonstrated induced nonlinear scattering of quasi-electrostatic pump waves by thermal electrons. Measurements of the magnetic field vectors for the pump and daughter waves allow for the determination of wave distribution functions, which indicate the direction of propagation for each of these waves. The experiment supports the theory of electromagnetic whistler wave generation through nonlinear scattering of electrostatic lower hybrid waves by thermal electrons in the Earth's magnetosphere.

[1]This work is supported by the NRL base program.

Erik Tejero
Naval Research Lab

Date submitted: 10 Jul 2014 Electronic form version 1.4