Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Efficient whistler wave excitation in laboratory and space plasmas[1] K.D. STROHMAIER, J.M. URRUTIA, R.L. STENZEL, UCLA — In a dense, weakly magnetized laboratory plasma, strong low frequency whistler modes are excited with magnetic loop antennas. Wave amplitudes in excess of the ambient magnetic field have been produced. When the loop axis is along the ambient field, the wave creates field reversals or field enhancements which propagate differently. Three-dimensional fields arise when the loop axis is orthogonal to B_0. In both cases, typically 10 kW of radiated power is obtained, as derived from internal magnetic field measurements as well as from external antenna current and voltage measurements. Such power levels are desirable to eject from spacecraft to control the population of trapped energetic electrons. Since it is difficult to deploy a properly scaled loop antenna in space, it is suggested to reproduce the laboratory plasma parameters with a dense plasma source on the spacecraft and to expand the plasma and field to the ambient conditions. The injected power will disperse since there is no wave cutoff. The expansion process can also be demonstrated in a nonuniform laboratory plasma.

[1]Work supported by DOE/NSF.

J. M. Urrutia
UCLA

Date submitted: 10 Jul 2008 Electronic form version 1.4