Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Nonlinear Resonance Cones and Converging Plasma Blobs[1]
NATHAN AGMON, North Hollywood High School, PATRICK PRIBYL, WALTER GEKELMAN, University of California, Los Angeles, JOE WISE, New Roads School, CAMI KATZ, Harvard Westlake School, CHRIS HA, Palos Veres Peninsula High School, BOB BAKER, University High School — Electric field resonance cones have been shown to create density disturbances in cold, magnetized plasmas.[2] Two circular antennas in the LAPTAG experimental plasma device were used to create converging, nonlinear resonance cones. The nonlinear electrostatic field is produced by large amplitude RF ($E_{RF}/nkT_e \gg 1$). A movable probe, powered by a computerized motor and consisting of three mutually orthogonal electric dipoles, is used to measure the electric field of the cones which become distorted at large amplitudes. A 2D movable Langmuir probe was used to determine localized density perturbations after turn-off of the RF power. A density blob moving at 3-5 times the ion sound speed has been observed to propagate away (for at least 20 cm) from the focus of the cone. Two ring antennas produced colliding blobs. The physics of the collision will be described.

[1]Work performed at the Basic Plasma Science Facility supported by DOE and NSF.
[2]W. Gekelman, R.L. Stenzel, Phys. Fluids, 20, 1316 (1977).

Nathan Agmon
North Hollywood High School

Date submitted: 03 Jul 2013 Electronic form version 1.4