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Mode conversion and heating in a UCLA-high schools collaborative experiment[1] MIANA SMITH, Wildwood School, SAMUEL BUCKLEY-BONNANO, Buckley High School, PATRICK PRIBYL, WALTER GEKELMAN, University of California, Los Angeles, JOE WISE, Wildwood School, BOB BAKER, Retired, KEN MARMIE, Roosevelt Middle School — A small plasma device is in operation for use by undergraduates and high school students at UCLA. Magnetic field up to 100 G, with density $10^8 \leq n_e \leq 10^{11} cm^{-3}$ and temperature $T_e < 3eV$ are available in a 50 cm diameter plasma 2 meters long. The plasma is generated by an ICP source at one end operating at about 500 kHz. For this experiment, a small plate located near the edge of the plasma column is used as an electrostatic launcher. High frequency waves $\omega_{ce} < \omega < 3\omega_{ce}$ are launched radially from the plate in the low-density region, with electric field perpendicular to B and to the density gradient. A Langmuir probe located some distance away axially measures plasma heating along a field line that passes several cm in front of the launcher, localized in radius with $\delta r \approx 1cm$ Absorption and strong electron heating are observed at the plasma resonant layer. We explore the "double resonance condition at which $\omega_{pe} = 2\omega_{ce}$. Here strong interaction with electron Bernstein waves is expected. The Bernstein waves are also launched at low power and their dispersion relation verified.

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