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Generation of intense magnetosonic waves by erupting laboratory simulations of solar coronal loops[1] SHREEKRISHNA TRIPATHI, WALTER GEKELMAN, Department of Physics and Astronomy, UCLA — Eruption of coronal loops in the ambient plasma of the sun is simulated in a laboratory experiment at UCLA. The laboratory plasma loops (simulations of coronal loops) are produced using an annular LaB_6 cathode and an annular anode mounted on two movable shafts in a large vacuum chamber. Two electromagnets produce a vacuum magnetic field along the arched axis of the plasma loop. Controlled flows of dense plasma are generated from the foot-points of the electrodes using laser beams that strike movable targets (C, LaB_6) placed behind the holes in the electrodes. This novel approach provides flexibility in independently controlling the timing and intensity of the flows. The vacuum chamber has an additional source to produce ambient magnetized plasma. In recent experiments, dramatic eruption of the loop plasma was observed following generation of super-Alfvénic flows ($V_{flow} \sim 2 - 5\ V_a$) from the foot-points. The erupting plasma loop sets up intense magnetosonic waves in the ambient plasma. We will present initial results on the loop eruption and excitation of the magnetosonic wave.

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