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Spontaneous Electromagnetic Emission from a Strongly Localized Plasma Flow¹ ERIK TEJERO, WILLIAM AMATUCCI, GURUDAS GANGULI, CHRISTOPHER CRABTREE, Naval Research Laboratory, CHRISTOPHER COTHRAN, Sotera, EDWARD THOMAS, Auburn University — The laboratory experiments to be presented establish that strongly localized DC electric fields perpendicular to the ambient magnetic field can behave as a radiation source for electromagnetic ion cyclotron waves, transporting energy away from the region of wave generation. *In situ* observations of sheared plasma flows collocated with electromagnetic wave activity have led to this laboratory effort to investigate the impact of electromagnetic, velocity shear-driven instabilities on the near-Earth space plasma dynamics. The transition from electrostatic to electromagnetic ion cyclotron (EMIC) wave propagation has been investigated under scaled ionospheric conditions. The general wave characteristics and wave dispersion experimentally observed are in agreement with the current theoretical models. In addition, the electromagnetic component of these waves increased by two orders of magnitude as the plasma β was increased. The observed EMIC waves are predominantly azimuthally propagating $m=1$ cylindrical waves, which propagate in the direction of the $\mathbf{E} \times \mathbf{B}$ drift. Experimental observations and comparison to theory will be presented.

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