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Ion flow shear measurements using LIF at the NRL SPSC¹
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WILLIAM AMATUCCI, Plasma Physics Division, U. S. Naval Research Laboratory — Ion cyclotron instabilities due to strongly sheared plasma flow have been studied experimentally at the Naval Research Laboratory Space Physics Simulation Chamber (SPSC). These experiments have characterized both electrostatic and, for the first time, electromagnetic instabilities as described in Tejero *et al*, Phys. Rev. Lett. **106**, 185001 (2011). A two-axis laser induced fluorescence (LIF) diagnostic has now been used to directly measure the flow profile generated in the plasma; previously, this profile could only be inferred from emissive probe electric field measurements. The 2mm spatial resolution of the LIF measurements is sufficient to observe the ion gyroscale flow shear required for the instability.

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