

Abstract Submitted
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Temperature Anisotropy of an Expanding Helicon Plasma within a Diverging Magnetic Fields Region CUYLER BEATTY, THOMAS STEINBERGER, RISA BEATTY, JACOB MCLAUGHLIN, LUKE NEAL, West Virginia University, EVAN AGUIRRE, Auburn University, EARL SCIME, West Virginia University — Temperature anisotropy in an expanding magnetized plasma was investigated using laser induced fluorescence (LIF). Ion velocity distribution functions (IVDF) were measured downstream from the source region in an area of diverging magnetic field. An approximately 5 cm² square area was interrogated at a radial (R) resolution of 2 mm and an axial (Z) resolution of 4 mm. IVDFs were measured parallel and perpendicular to the machine axis simultaneously using a mechanical scanning probe. The second moment of both the parallel and perpendicular IVDFs were compared to reveal a thermal anisotropy of nearly 10. A simple Boris stepper code was used to simulate ion motion from the plasma source through the expansion region. The code uses the measured electric field structure. The model reproduces the essential features of the measured IVDFs.

Cuyler Beatty
West Virginia University

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