KELVIN-HELMHOLTZ INSTABILITY IN A SHEARED FLOW ACTUATED BY A MAGNETIC FIELD*

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The Kelvin-Helmholtz instability can lead to plasma transport across a magnetic field; one example is the solar wind transport across the earth's magnetopause in the magnetotail. In an experiment done at the Nevada Terawatt Facility, we observed the Kelvin-Helmholtz instability in a laser produced plasma that interacted with an external magnetic field. This instability is evidenced by the presence of evenly spaced vortices on the plasma-field boundary. Due to the interaction with the external magnetic field, a velocity gradient perpendicular to the plasma velocity forms at this boundary. The presence of vortices in a region of sheared flow is characteristic of the development of the Kelvin-Helmholtz instability. The observed structure and its growth rate indicate that large ion Larmor radius effects contribute to its formation. Discussions of the mechanism producing the sheared flow and the resulting instability will be presented.

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