Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Sorting Category: 1.5.2 (E)

Nonlinear Dynamics of Fluctuations and Convective Blobs in the Presence of Sheared Flows in a Magnetized Laboratory Plasma[1] L. YAN, M. GILMORE, C. WATTS, S. XIE, University of New Mexico — It has been observed that some instabilities can be triggered by localized flows, both azimuthally and axially. It also has been demonstrated that the presence of sheared flows at the plasma edge is strongly correlated to the reduction of low frequency instabilities and associated cross-field transport. To investigate the details of how those instabilities interact with plasma flows, experiments are being conducted in the HELCAT (HELicon-CAThode) linear device at UNM. HELCAT is a 4 m long device, with B $<$ 0.22 T, and peak helicon-produced densities, n $\sim 10^{13}$ cm^{-3}. Sheared ExB flows, generated via biased concentric rings, are utilized to modify the flow profile. Fluctuations and flux are monitored with probe arrays, and flows, both azimuthal and axial, are measured by a Mach probe. It is found that drift waves are present when RF power exceeds a pressure-dependant threshold. Biasing can suppress the drift instability, while increased bias drives a new mode, believed to be Kelvin-Helmholtz. Parameters, such as RF power, gas pressure, bias voltage, and magnetic field, are investigated for their effects on plasma behavior. Experimental and analysis results will be presented.

[1]Work supported by the U.S. D.o.E. under grant no. DE-FG02-04ER54791.

Mark Gilmore
gilmore@ece.unm.edu
University of New Mexico

☐ Prefer Oral Session
☒ Prefer Poster Session

Date submitted: 19 Jul 2007 Electronic form version 1.4