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Search for chaos in the transition to drift wave turbulence M.J. BURIN, J.A. NOGUEZ, CSU San Marcos, G.R. TYNAN, S.H. MULLER, M. XU, UCSD — In the transition to fully developed turbulence one may encounter chaotic regimes, as has been demonstrated both theoretically and experimentally in a variety of flows, including within magnetized plasmas. Such regimes appear as windows of low-dimensional order, allowing for a better understanding of the underlying nonlinear dynamics, which may in turn allow for new avenues of control. We have recently begun a study of the turbulent transition in the Controlled Shear De-Correlation Experiment (CSDX), a helicon-powered magnetized plasma column at UCSD, in light of chaotic signatures such as the maximum Lyapunov exponent as derived from Langmuir probe time-series. We report our preliminary results on the role of chaos in the transition in general and with respect to the emergence of a self-organized shear layer (zonal flow) in particular.

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