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**Energy Exchange Dynamics across L-H transitions in NSTX**[1] A. DIALLO, PPPL, S. BANERJEE, IPR India, S. ZWEBEN, T. STOLTZFUS-DUECK, PPPL — This work is motivated by the need to test L-H transition paradigms (e.g., predator-prey, and ExB flow suppression) and explore possible new L-H transition dynamics. We present analysis of the L-H transition on three sets (NBI, RF, and Ohmic) of NSTX discharges using the gas-puff-imaging diagnostics for high temporal and spatial resolutions. The analysis studies the edge velocities and energy dynamics across the L-H transition using an implementation of the orthogonal decomposition programming for high temporal resolution velocity fields. In the database NSTX discharges, the production term (computed 1 cm inside the separatrix) is negative, pointing to transfer from the DC flows to the fluctuations, even immediately before the L-H transition. This suggests that depletion of turbulent fluctuation energy via transfer to the mean flow may not play a key role in the L-H transition. The thermal free energy is consistently much larger than the kinetic energy produced by the mean poloidal flow across the L-H transitions. These observations are inconsistent with the predator-prey model. The paper will describe the analysis including error estimations. Furthermore, analysis of the radial correlation dynamics across the L-H transition will be discussed.

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