PS1-04

# New Paradigm for the *m/n=1/1* mode ("Sawtooth Oscillation") Based on High Resolution 2-D Images of $T_e$ Fluctuations and Comparisons with Theoretical Models

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Two dimensional (2-D) images of electron temperature fluctuations with high temporal and spatial resolution were employed to study the m/n=1/1 mode (sawtooth oscillation) in Toroidal EXperiment for Technology Oriented Research (TEXTOR) tokamak plasmas. The new findings are: 1) A pressure driven instability ("pressure finger", but not a ballooning mode) leads to an "X-point" reconnection process. 2) The reconnection process is a random 3-D local reconnection process. 3) The crash time scale is similar to that of the kink type or tearing types and is significantly faster than the resistive time scale. 4) Heat flow from the core to the outside of the inversion radius during the reconnection process is highly collective. Comparative studies with prominent theoretical models suggest that a new physics paradigm is needed to describe the physics of the m/n=1/1 mode crash.