

**Abstract Submitted for the 56th Annual Meeting  
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Category Number and Subject: Undergraduate Student

Theory     Experiment

**Analysis of Sawtooth Post-Cursor Oscillations in Low Safety Factor DIII-D Plasmas,\*** J.D. Cabrera, *UCI*; C. Paz-Soldan, E.J. Strait, *GA*; D. Shiraki, *ORNL* – Large sawtooth oscillations are a commonly observed phenomenon in very low safety factor ( $q_{95} \sim 2$ ) plasmas. Following the sawtooth crash phase, low frequency ( $\sim 200$  Hz) post-cursor oscillations in the magnetic field, with amplitudes  $\sim 2$  G decaying in time, are excited. These post-cursor oscillations do not exhibit the usual  $m$ =odd poloidal structures of sawtooth oscillation, but instead are found to be  $m$ =even in structure, suggesting the excitation of global kink modes. A novel means of modeling such post-cursor oscillations is presented via computational analysis of data obtained from high-resolution magnetic sensors installed at the DIII-D tokamak facility. Nonlinear regression analysis is used to obtain modeling parameters such as rates of decay and rotation. Trends in parameters over many oscillations are then compared with equilibrium plasma parameters. The impact of measured parameters on global instability onset and disruption prediction is considered.

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