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Category Number and Subject: 5.6.2 DIII-D Tokamak

Theory Experiment

Comparison of Sawteeth Behavior in Ovals and Beans,*

E.A. Lazarus, M.R. Wade, *ORNL*, M.E. Austin, F.L. Waelbroeck, *U. Texas*, K.H. Burrell, M.S. Chu, A.W. Hyatt, T.C. Luce, T.H. Osborne, C.C. Petty, P.A. Politzer, R. Prater, J.T. Scoville, *GA*, R.J. Jayakumar, M.A. Makowski, *LLNL*, H. Reimerdes, *U. Columbia* – A set of experiments has been conducted in DIII-D to compare sawteeth in bean and oval shaped, inner-wall limited plasmas. The distinction is that the oval will violate the ideal Mercier criterion with q_0 somewhat above 1, while a low κ bean shape will remain ideally Mercier stable with q_0 somewhat below 1. With these shapes we hope to resolve the roles of the interchange and internal kink instabilities in the sawtooth collapse. A new approach has led to an unprecedented level of detail in our knowledge of the equilibrium, in particular, the evolution of the magnetic shear in the two cases. This has motivated recent experiments that focused on using central electron cyclotron heating to investigate the flux surface integrity in the interior region of the oval. Recent experimental results will be reported.

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