

Abstract Submitted  
for the DPP15 Meeting of  
The American Physical Society

**Current/Pressure Profile Effects on Tearing Mode Stability in DIII-D Hybrid Discharges**<sup>1</sup> K. KIM, SNU/ORNL, J.M. PARK, M. MURAKAMI, ORNL, R.J. LA HAYE, GA, YONG-SU NA, SNU — It is important to understand the onset threshold and the evolution of tearing modes (TMs) for developing a high-performance steady state fusion reactor. As initial and basic comparisons to determine TM onset, the measured plasma profiles (such as temperature, density, rotation) were compared with the calculated current profiles between a pair of discharges with/without n=1 mode based on the database for DIII-D hybrid plasmas. The profiles were not much different, but the details were analyzed to determine their characteristics, especially near the rational surface. The tearing stability index calculated from PEST3,  $\Delta'$  tends to increase rapidly just before the n=1 mode onset for these cases. The modeled equilibrium with varying pressure or current profiles parametrically based on the reference discharge is reconstructed for checking the onset dependency on  $\Delta'$  or neoclassical effects such as bootstrap current. Simulations of TMs with the modeled equilibrium using resistive MHD codes will also be presented and compared with experiments to determine the sensibility for predicting TM onset.

<sup>1</sup>Work supported by US DOE under DE-FC02-04ER54698 and DE-AC52-07NA27344.

K. Kim  
SNU/ORNL

Date submitted: 24 Jul 2015

Electronic form version 1.4