ELM Triggering Dependence on Deuterium Pellet Size on DIII-D, * L.R. Baylor, N. Commaux, S.J. Meitner, ORNL; C.J. Lasnier, M.E. Fenstermacher, S.L. Allen, LLNL; A.W. Leonard, P.B. Parks, GA; R.A. Moyer, UCSD – The triggering of small ELMs by pellet injection has been demonstrated as a method to prevent large ELMs that can erode plasma facing components [1]. Small deuterium pellets < 1mm in size have been shown to reliably trigger ELMs on the DIII-D tokamak in the ITER like scenario plasmas. A variation in pellet size and speed was used to determine the minimum pellet size needed to trigger ELMs as a function of edge pedestal pressure. Pellets < 0.8 mm in size were found to be insufficient to trigger ELMs. These results show smaller pellets than predicted by nonlinear MHD simulations can destabilize high-n ballooning modes from a local pressure perturbation well in excess of the pedestal pressure [2]. The implications of these results for pellet ELM mitigation and the design of the pellet injection system for ITER will be discussed.


*Work supported by the US Department of Energy under DE-AC05-00OR22725, DE-AC52-07NA27344, DE-FC02-04ER54698, and DE-FG02-07ER54917.