The Effect of Different Fast-ion Instabilities on the Fast-ion Profile

E. RUSKOV, W. HEIDBRINK, D. LIU, UC Irvine, E. FREDRICKSON, A. BORTOLON, PPPL — Fast-ion driven instabilities in NSTX take many forms, including steady, bursting, and avalanching toroidal Alfven eigenmodes (TAE), avalanching global AEs, energetic particle modes (EPM), long-lived modes (LLM) and abrupt large-amplitude events (ALE). The occurrence or absence of these modes on Mirnov signals correlates with the ratio of fast-ion to Alfven speed and the ratio of fast-ion to thermal pressure [1]. The drop in neutron rate at these events correlates differently with mode amplitude for the different types of events [1]. In this study, we expand this database to investigate the correlation of vertical fast-ion D-alpha (FIDA) data with the different types of MHD. The measured profiles are compared with classically-predicted profiles.


Work supported by US DOE grant DE-FG02-06ER54867.

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Date submitted: 10 Jul 2014