Building a database for statistical characterization of ELMs on DIII-D[1] B.J. FRITCH, University of Northern Iowa, A. MARINONI, MIT, A. BORTOLON, PPPL — Edge localized modes (ELMs) are bursty instabilities which occur in the edge region of H-mode plasmas and have the potential to damage in-vessel components of future fusion machines by exposing the divertor region to large energy and particle fluxes during each ELM event. While most ELM studies focus on average quantities (e.g. energy loss per ELM), this work investigates the statistical distributions of ELM characteristics, as a function of plasma parameters. A semi-automatic algorithm is being used to create a database documenting trigger times of the tens of thousands of ELMs for DIII-D discharges in scenarios relevant to ITER, thus allowing statistically significant analysis. Probability distributions of inter-ELM periods and energy losses will be determined and related to relevant plasma parameters such as density, stored energy, and current in order to constrain models and improve estimates of the expected inter-ELM periods and sizes, both of which must be controlled in future reactors.

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