Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

An Integrated Model for Fast Ion Losses in JET Plasmas Supported by Measurement P. J. BONOFIGLO, M. PODESTA, Princeton Plasma Physics Laboratory, V. KIPTILY, Culham Centre for Fusion Energy of UKAEA, V. GOLOBORODKO, Kyiv Institute for Nuclear Research, A. HORTON, P. BEAUMONT, Culham Centre for Fusion Energy of UKAEA, F. E. CECIL, Colorado School of Mines, C. GIROUD, Culham Centre for Fusion Energy of UKAEA, JET CONTRIBUTORS COLLABORATION[1] — As JET's 2021 DT-campaign approaches, the development of fully integrated fast ion transport models is needed to better examine future alpha confinement and losses. JET's 2019-2020 deuterium campaign was used as a testbed for examining fast ion confinement and transport where MeV scale ICRH heated deuterium NBI ions, as well as DD-fusion products, acted as proxies for DT-alpha particles. This presentation details the development of a predictive model for fast ion losses in JET deuterium plasmas supported by measurement. Fast ion loss measurements are reported via an array of Faraday cup fast ion loss detectors which have recorded losses due to MHD activity, including: tearing modes, kink modes, sawteeth, and fishbone modes. Analytic representations for the perturbations are used as input into the reduced transport ORBIT-kick model which calculates transport matrices for use in TRANSP/NUBEAM. The NUBEAM computed fast ion distributions are biased against the distribution assembled from reverse-orbit integrating ions from a synthetic loss detector providing a weight for the modeled particles, relative to a detection event, for comparison to measurement.

[1]See the author list of E. Joffrin et al. 2019 Nucl. Fusion 59 112021

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Date submitted: 30 Jun 2020 Electronic form version 1.4