Abstract Submitted
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Novel measurements of Alfven Eigenmode stability via active antenna excitation in JET plasmas[1] RA TINGUELY, M PORKOLAB, MIT PSFC, N FIL, S DOWSON, M FITZGERALD, D KEELING, S SHARAPOV, CCFE, P PUGLIA, A FASOLI, D TESTA, EPFL SPC, N DREVAL, IPP NSC KIPT, R DUMONT, CEA IRFM, Y KAZAKOV, LPP-ERM/KMS, Z LIN, UCI, M NOCENTE, J ONGENA, IPST NRC, JET TEAM[2] — Novel measurements of Alfven Eigenmode (AE) stability have been made via active antenna excitation in JET [Puglia 2016 NF]. For the first time in JET energetic particle experiments, we report the real-time tracking of a stable AE after its transition from being driven by RF-heated fast ions. We also report stable AE tracking at high heating power, 4MW RF and 20MW NBI in a D-3He plasma. During the 2019-2020 D campaign, 5000 MHD resonances and their frequencies (30-250kHz), damping rates (0-13kHz), and toroidal mode numbers (n<30) were detected. Good agreement is found between mode numbers applied by the antenna and measured of the resonances. Dedicated experiments explored plasma-antenna coupling, and resonance detection is more likely in limited as opposed to X-point plasmas and as plasma-antenna separation decreases, agreeing with simulations [Dvornova 2020 PoP]. Results are compared with MHD and gyrokinetic simulations [Aslanyan 2019 NF] to assess various drive and damping mechanisms including alpha particles in future DT experiments.

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

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