Abstract Submitted
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MARS-K Modeling Validation for Rotation and Fast-Ions Impact on RWM Stability in DIII-D Plasmas[1] F. TURCO, J.M. HANSON, G.R. NAVRATIL, Columbia U., Y. LIU, Euratom/CCFE, M.J. LANCTOT, A.D. TURNBULL, General Atomics — New MARS-K modeling results have been obtained to validate the theory that links the stabilization of the RWM to the presence of toroidal rotation and kinetic resonances. A β_N scan previously analyzed with MARS-F (ideal MHD only), whose results showed a peak in plasma response amplitude at the β_N no-wall limit, has been modeled including kinetic wave-particle resonances and non-resonant fast-ion damping. The damping physics increases the accuracy of the match with experimental data by a factor of $\sim$2 up to $\sim$80% of the no-wall limit. The cases at and above the limit are overestimated. New experimental data have been obtained in a rotation scan, extending the range of explored rotations by a factor of $\sim$2. The downward trend of the response amplitude stops at $\sim$60 km/s and an increasing slope is present at higher rotation. MARS-K correctly reproduces experimental trend, but the amplitude is overestimated by a factor of $\sim$2, consistently with the results of the high β_N cases.

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