Abstract Submitted
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Effect of rotation magnitude and shear on tokamak plasma response to three-dimensional magnetic perturbations[1] B.C. LYONS, ORISE/General Atomics, N.M. FERRARO, R. NAZIKIAN, PPPL, C. PAZ-SOLDAN, General Atomics — Three-dimensional magnetic perturbations are routinely used in tokamaks to control error fields, particle transport, and edge-localized modes (ELMs). In ELM-suppressed plasmas, a zero-crossing of the electron rotation profile is observed at the top of the pedestal and is believed to play a crucial role in suppression. Using single-fluid, time-independent, linear modeling with the M3D-C1 extended magnetohydrodynamics code, a systematic variation of the zero-crossing and shear of the rotation profile is performed. The resonant tearing drive at a rational surface as the rotation approaches zero is quantified. Furthermore, it is shown that a zero-crossing permits amplification of near-resonant poloidal Fourier harmonics and a reduction of other harmonics at a flux surface. The impact of these phenomena on observables will be assessed. The effect of rotation shear and two-fluid terms will also be explored.

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