

Abstract Submitted
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Influence of axisymmetric plasma shape on the plasma response to resonant magnetic perturbations¹ S. GU, ORAU, C. PAZ-SOLDAN, Y. Q. LIU, B. C. LYONS, D. WEISBERG, GA, Y. SUN, H. H. WANG, ASIPP, W. SUT-TROP, M. WILLENSDORFER, IPP, N. C. LOGAN, J.-K. PARK, PPPL, D. A. RYAN, A. KIRK, CCFE, Q. MA, USTC, M. W. SHAFER, ORNL — The non-axisymmetric plasma response to resonant magnetic perturbations (RMPs) is investigated for DIII-D, EAST and ASDEX Upgrade tokamaks using the MARS-F code, by systematically varying the axisymmetric plasma shape in triangularity, whilst keeping other equilibrium quantities largely unchanged or deliberately scanning them. The magnetic plasma response decreases with triangularity in both resonant harmonics and sensor measurements. Comparison of experimental measurements and modeling results shows agreement in trends. Multi-modal analysis of the simulation results extracts the mode structure and phasing dependence of each mode, and the amplitude of the dominant mode decreases with triangularity like the sensor measurements. Targeted comparisons with the GPEC code also reveal broadly similar trends in the resonant drive with shaping. The plasma response is strongly shielded at high triangularity compared to that at low triangularity, which implies different control effects of edge localized modes (ELMs) in shaping. This result suggests that it is more difficult to control ELMs at high triangularity, thus further coil optimization is required for better control ELMs.

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