Abstract Submitted
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Gyrokinetic particle simulation of nonlinear generation of second harmonics of GAM[1] H.S. ZHANG, Z.Y. QIU, I. HOLOD, W.L. ZHANG, Y. XIAO, Y.J. MAO, X.G. WANG, L. CHEN, Z. LIN — Nonlinear generation of second harmonics of the geodesic acoustic mode (GAM) has been observed in D-IIID tokamak. In this work, we use the gyrokinetic toroidal code (GTC) to study GAM nonlinear coupling. With a GAM amplitude in the range of experimental values, we observe the nonlinear generation of a second harmonics with a frequency of $2\omega_{GAM}$ (ω_{GAM} is the linear GAM frequency). The second harmonics is dominated by an electrostatic potential with n=m=0 (n and m are toroidal and poloidal mode number, respectively), and a density perturbation with n=0 and m=1. The amplitude of the second harmonics is proportional to the intensity of the primary harmonics, as expected from a quadratic nonlinearity due to toroidal coupling of surface averaged potential and GAM density perturbation. Comparison of eigenmode structures from GTC simulation with D-IIID measurements will be presented.

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