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Second harmonic effect on geodesic modes in tokamak plasmas

Physics of Plasmas **20**, 052116 (2013); <https://doi.org/10.1063/1.4807039>A. G. Elfimov¹, A. I. Smolyakov^{2,3}, A. V. Melnikov³, and R. M. O. Galvão¹[View Affiliations](#)[View Contributors](#) PDF

ABSTRACT

Results of a kinetic treatment of Geodesic Acoustic Modes (GAMs) that fully takes into account ion parallel dynamics, including the magnetic field component, are presented. The finite-orbit-width (FOW) parameter is considered in the calculation of the second harmonic effect on GAMs. For larger values of the FOW parameter, it is shown that dispersive effects related to the $m = 2$ harmonics is the cause of the mode frequency splitting and the modes appear due to the interaction with the ion sound mode. Furthermore, the modes may have enhanced damping rates due to second harmonic Landau damping.

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