

Abstract Submitted
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On Nonlinear Geodesic Acoustic Modes in Tokamak Plasmas¹

ZHIYONG QIU, IFTS, ZJU, LIU CHEN, IFTS, ZJU and UCI, FULVIO ZONCA, ENEA, Frascati — It is shown that, in tokamak plasmas, finite drift/banana-orbit width (FOW) effects play crucial roles in the nonlinear evolution of Kinetic/Geodesic Acoustic Modes (KGAM/GAM) [1, 2]. In particular, it is found that, in contrast to the negligible second-harmonic generation, KGAM/GAM can generate appreciable zero-frequency zonal flow (ZFZF) [3] due to the FOW effects. On the other hand, it is shown that, ZFZF has negligible effects on the dynamics of GAM/KGAM. The implications of these findings for nonlinear dynamic evolutions of zonal structures spontaneously generated by drift wave turbulences are discussed.

[1] N. Winsor, J. L. Johnson and J. M. Dawson, *Phys. Fluids* **11**, (1968) 2448.

[2] F. Zonca and L. Chen, *Europhys. Lett.* **83**, (2008) 35001.

[3] M. Rosenbluth and F. Hinton, *Phys. Rev. Lett.* **80**, 724 (1998).

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Zhiyong Qiu
Institute for Fusion Theory and Simulation, Zhejiang University, China

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