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Gyrokinetic simulation studies on the energetic-particle-induced geodesic acoustic mode KAZUHIRO MIKI, YASUHIRO IDOMURA, Japan Atomic Energy Agency — Understanding of the energetic particles physics is of great interest in the future burning plasmas. Particularly, particle loss in the presence of EGAM may be critical for ITER. We thus need to know how EGAM is excited and interacts with turbulence. We here introduce energetic particles in a full-f gyrokinetic code (GT5D). (i) We find linear dynamics of the EGAM driven by bump-on-tail particle distributions. We examine flat-q, homogeneous, axisymmetric, electrostatic gyrokinetic simulations. Above a certain level of the beam intensity, an oscillatory mode grows with about a half of the standard GAM. The observed frequencies are consistent with the eigenmode analyses derived from the perturbed gyrokinetic equations. The theoretical analyses also indicate a bifurcation of the excited modes depending on q-value. Estimation of the finite-orbit-width effects can provide a size dependency of the EGAM growth rate. (ii) We find linear and nonlinear dynamics of the EGAM driven by slowing-down distributions. We examine the axisymmetric gyrokinetic simulations with DIII-D-like parameters. The observed growth rates and frequencies are consistent with results of other hybrid code. Furthermore, we will focus on nonlinear phase space dynamics, namely chirping mode. This work is supported by HPCI Strategic Program Field No.4: Next-Generation Industrial Innovations, funded by the MEXT, Japan.

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