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Nonlinear simulations of Alfvénic instabilities driven by energetic particles in a reversed shear tokamak plasmas XIN WANG, Institute for Fusion Theory and Simulation, Zhejiang University, SERGIO BRIGUGLIO, Associazione EURATOM-ENEA sulla Fusione, CP 65-00044 Frascati, Roma, Italy, LIU CHEN, Institute for Fusion Theory and Simulation, Zhejiang University, 310027, Hangzhou, China; Dept. of Physics and Astronomy, University of California, GIULIANA FOGACCIA, GREGORIO VLAD, FULVIO ZONCA, Associazione EURATOM-ENEA sulla Fusione, CP 65-00044 Frascati, Roma, Italy — The extended version of nonlinear hybrid magnetohydrodynamic (MHD)-Gyrokinetic code HMGC [1](XHMGC) is used to investigate the reversed shear Alfvén eigenmodes (RSAE)/energetic particle modes (EPM) driven by an anisotropic Maxwellian energetic particles with reversed shear q profiles. In the region near the minimum-q surface, EPM are shown to exist inside the kinetic low-frequency shear Alfvén continuum gap. Fast non-adiabatic down-ward chirping frequency is found for given equilibrium profiles, which is understood as consequence of nonlinear wave particle dynamics. In our current case, the mode structure is dominated by two neighbor poloidal components, while wave energetic particle interaction is dominated by the sidebands of the dominant transit resonance.

[1]S. Briguglio *et al.*, Phys. Plasmas **2** 3711 (1995).

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