Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Simulation on parametric decay instability excited by oscillating pump near lower hybrid frequency. WEI KONG, Civil Aviation University of China, China; Auburn University, USA, XUEYI WANG, YU LIN, Auburn University, USA, LIU CHEN, Zhejiang University, China; University of California, Irvine, USA — Decay instability of lower hybrid waves is important in plasma heating. Simulation of the instability must include both electron and ion kinetics with real mass ratio. In this work, the gyrokinetic electron and fully kinetic ion (GeFi) particle simulation model is used to study the parametric instabilities in uniform magnetized plasmas. The pump electric field near the lower hybrid frequency is treated in the dipole approximation. Three types of parametric decay processes, including the purely growing modulational instability, the non-resonant decay instability, and the resonant decay instability are obtained. Dependences of the parametric growth rates on wavenumber, pump strength and pump frequency are systematically investigated. The simulation results are compared with the predictions of existing linear theories. Effects of electron-to-ion temperature ratio on the non-resonant and resonant decays are also discussed.

Wei Kong
Civil Aviation University of China, China; Auburn University, USA

Date submitted: 02 Jul 2019 Electronic form version 1.4