Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Gyrokinetic particle simulations of reversed shear Alfvén eigenmode excited by antenna and fast ions[1] WENJUN DENG, ZHIHONG LIN, IHOR HOLOD, University of California, Irvine, XIN WANG, IFTS, Zhejiang University, China, YONG XIAO, University of California, Irvine, WENLU ZHANG, University of Science and Technology of China — Global gyrokinetic particle simulations of reversed shear Alfvén eigenmode (RSAE) have been successfully performed and verified. We have excited the RSAE by initial perturbation, by external antenna, and by energetic ions. The RSAE excitation by antenna provides verifications of the mode structure, the frequency, and the damping rate. When the kinetic effects of the background plasma are artificially turned off, the mode excited by antenna shows a structure and a frequency similar to the theoretical calculation and the mode amplitude shows a near-linear growth. When kinetic thermal ions are added in, the mode amplitude eventually saturates due to the ion Landau damping. The damping rate is measured from the saturation level. The RSAE excited by fast ions shows an exponential growth. Comparing to the antenna excitation, the mode structure and the frequency are modified by the fast ions. With kinetic thermal ions, the mode frequency increases due to the raise of the Alfvén continuum, while the mode structure has no significant change. The results are benchmarked with XHMGC simulations and good agreements are obtained.

[1]This work was supported by the U. S. Department of Energy (DOE) SciDAC GSEP center.

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Date submitted: 22 Jul 2010 Electronic form version 1.4