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Kinetic MHD Simulations of Shear Alfvén Waves Driven by Fast Particles in a Tokamak[1] ZHAO-QING HU, Dalian University of Technology, PING ZHU, University of Science and Technology of China, University of Wisconsin-Madison, CHARLSON C. KIM, General Fusion Inc., ZHENG-XIONG WANG, Dalian University of Technology — Shear Alfvén waves (SAWs) such as the toroidal Alfvén eigenmodes (TAEs) can be excited by fast particles in burning plasma tokamak experiments such as ITER. In this work, we conduct kinetic-MHD simulations of TAEs driven by fast particles in a tokamak geometry using the NIMROD code. For simplicity, a q-profile with a single gap in the SAW spectrum is adopted. A global SAW is observed in simulations. Its frequency is located in the gap, which is in good agreement with the ideal MHD frequency of the corresponding TAE. The SAW mode structures in velocity and magnetic fields resemble the characteristic mode pattern of a TAE. Further benchmarks with theory or other codes on the TAE scalings will be presented.

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