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Energetic particle driven Alfvénic instabilities by a kinetic-fluid model Y. NISHIMURA, C.Z. CHENG, Plasma and Space Science Center, National Cheng Kung University — A kinetic-fluid model[1] is successfully implemented into a massively parallel numerical simulation code. Excitation of TAE mode in a tokamak geometry is demonstrated.[2] The kinetic-fluid model incorporates all the particle dynamics through the pressure tensor by taking the second order moment of the particle simulation while the electromagnetic field quantities are evolved in the fluid equations. Continuing efforts on the development of the model are reported. The key elements are the treatment of kinetic electrons, shaped geometry, and high beta plasma application. The similarity and the difference (in gyrokinetic Poisson equation) between electromagnetic gyrokinetic simulation models are discussed. This work is supported by National Cheng Kung University Top University Project.

[1]C.Z.Cheng and J.R.Johnson, J. Geophys. Res. **104**, 413 (1999).
[2]Y.Nishimura and C.Z.Cheng J. Plasma and Fusion Research Series **9**, (2010).

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