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AEGIS-GK: Gyrokinetic investigation of resistive wall mode stability[1] L.J. ZHENG, M. KOTSCHENREUTHER, J.W. VAN DAM, Institute for Fusion Studies, Univ. of Texas -Austin — The stability of resistive wall modes (RWM) is an issue of concern for burning plasma confinement, e.g., in ITER. The kinetic resonances, as well as the shear Alfvén resonance, have been shown to be important for RWM stability. However, due to the complexity of kinetic effects, only hybrid models with partial kinetic effects have so far been used to investigate RWM stability. The success in recovering full MHD with our newly derived gyrokinetic theory [Phys. Plasmas **14**, 072505 (2007)] now allows the possibility to study RWMs in a self-consistent kinetic manner. We will present our scheme for a gyrokinetic treatment of RWMs and also analyze various kinetic effects. In particular, we will demonstrate that the parallel electric field, missing in conventional kinetic treatments, cannot be ignored in studying the effects of wave-particle resonances on RWMs. Also, we will show how the kinetic resonances and the shear Alfvén resonance can couple with each other. Preliminary numerical results from the AEGIS-GK code, which incorporates the new gyrokinetic theory, will be also presented.

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