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Kinetic stability of internal kink in ITER standard operation BO HU, RICCARDO BETTI, University of Rochester, JANARDHAN MANICKAM, Princeton Plasma Physics Laboratory — In tokamak discharges, the central safety factor reduces as the plasma current diffuses into the plasma center. When the safety factor at the magnetic axis falls below unity, the plasma is susceptible to $m/n = 1/1$ internal kink. According to the predictions of fluid theory, the internal kink stability properties depend critically on the pressure gradient, magnetic shear and safety factor in the central region. Since the large-aspect-ratio low-beta expansion shows that the fluid contributions to the mode energy are of higher order (ϵ^4) in the inverse aspect ratio compared to $m \neq 1$ modes (ϵ^2), non-ideal contributions such as the kinetic effects of all the particle species can play an important role in determining the internal kink stability. We have developed a kinetic postprocessor of the MHD stability code PEST1 to calculate the kinetic contribution to the energy principle from the thermal particle species as well as the fusion alpha particles. The calculation is carried out for equilibria typical of ITER standard operation scenario. This work was supported by the US-DOE under Contracts DE-FG02-93ER54215 and DE-AC02-CH03073.

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