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Analysis and simulation of double tearing modes Y. NISHIMURA, J.M. CHEN, C.Z. CHENG, Institute of Space and Plasma Sciences, National Cheng Kung University — Tokamak experiments with non-monotonic q-profile have attracted attention to the stability problem of double tearing modes. Interestingly, double tearing modes are one of the good examples where the pressure anisotropy effects become prominent. The bootstrap current contribution on the Δ' depends on the sign of $(dp/dr)/s$ (s is the magnetic shear, (dp/dr) is the pressure gradient), which is different on the inner surface and the outer surface, The Δ' matrix, including off diagonal elements are calculated by solving exterior equation.¹ The analysis is compare with the numerical results from a three dimensional initial value simulation. The nonlinear evolution of toroidally asymmetric $m/n = 2/1$ island chains has been investigated. To incorporate the pressure anisotropy, the kinetic-fluid model is employed² which replace the pressure evolution equation with the second order moment of the kinetic ions and electrons from kinetic (particle) simulation.

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²C.Z. Cheng and J.R. Johnson, J. Geophysical Res.**104**, 413 (1999); Y. Nishimura and C.Z. Cheng, J. Plasma and Fusion Res. Series **9**, 452 (2010).

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