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Improved Numerical Technique to Solve the Linear Resistive MHD Problem[1] S. GALKIN, Keldysh Institute, M.S. CHU, J.M. GREENE, R.L. MILLER, A.D. TURNBULL, General Atomics, A. PLETZER, Princeton Plasma Physics Laboratory — A new approach to study the resistive MHD modes is described, based on the usual assumption that the plasma resistivity and mass are essential only in thin layers around resonance surfaces whereas the outer plasma is ideal and inertia free. The toroidal resistive energy principle is based on a matching of corresponding asymptotic solutions coefficients from the outer and inner plasma layers. A crucial problem here is to treat the outer region infinite non-integrable solutions near resonance surfaces accurately. Some difficulties can arise here such as the unstable behavior of the numerical solutions against input noise with exact total solution, or the need for many coefficients of the Frobenius expansion with approximate total solution. We utilize a technique to extract the infinite solutions more accurately numerically for a wide range of parameters. The technique described here was incorporated in the new version of the TWIST-R code. We show effects of inner layer resistivity, plasma rotation, magnetic well and the role of ideal parity solutions.

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