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Numerical Analysis of the 2D Newcomb Equations for the Resistive Wall Modes (RWMs),* J. Shiraishi, *ORISE*, M.S. Chu, *GA*, S. Tokuda, N. Aiba, *JAEA*, and M. Furukawa, *U. Tokyo* – Stabilization of the RWM is one of the most important design issues for future reactors operated in the advanced tokamak regime. The MARG2D [1] stability code, which solves the 2D Newcomb equations [2], is extended to study the stability of the RWM. The linear dynamics of the perturbations in RWM obeys the functional [3] $\delta W_r=\delta W_p+\delta W_{IV}+\delta W_{OV}+D_w=0$, where δW_p is the plasma potential energy, $\delta W_{IV(OV)}$ the vacuum magnetic energy inside (outside) the resistive wall, and D_w the energy dissipated in the resistive wall. In MARG2D, δW_p and δW_{OV} are given by bilinear functionals of the displacements and the perturbed magnetic field. δW_{IV} is described by a scalar potential and solved by the finite element method. Results from the MARG2D code are compared with those given in [3]. The solutions of the eddy current on the resistive wall will also be compared with new WKB solutions.

[1] N. Aiba, *et al.,* Plasma Phys. Control. Fusion **46**, 1699 (2004).
[2] S. Tokuda and T. Watanabe, Phys. Plasmas **6**, 3012 (1999).
[3] M.S. Chu, *et al.,* Nucl. Fusion **43**, 441 (2003).

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