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Improvement of the numerical matching technique for resistive MHD stability analysis[1] M. FURUKAWA, Grad. Sch. Frontier Sci., Univ. Tokyo, S. TOKUDA, RIST — We have developed a new numerical matching technique for linear stability analysis of resistive MHD modes [1]. This technique utilizes an inner layer with a finite width, which is in contrast to the asymptotic matching where the inner layer is taken to be infinitely thin. This singular nature of the asymptotic matching introduces some practical difficulties. For example, the accurate numerical calculation of the so-called matching data is not easy. In the new matching technique, we solve the MHD equation including (excluding) plasma inertia and electrical resistivity in the inner layer (outer region) as in the asymptotic matching. However, those difficulties are removed since we do not need to tackle the singularity head-on if the inner-layer width is finite. In this study, we improve our technique by correcting the outer-region solution in a successive manner, where the plasma inertia and resistivity are taken into account. The ideal MHD solution in the previous study [1] serves as the zeroth-order solution.

[1] M. Furukawa, S. Tokuda and L. -J. Zheng, Phys. Plasmas vol.17, 052502 (2010).

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