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**Continuum Damping of Free-boundary TAE with AEGIS** EUGENE CHEN, HERB BERK, BORIS BREIZMAN, LINJIN ZHENG, IFS, UT Austin — An extension has been added to the ideal MHD code AEGIS (Adaptive EiGenfunction Independent Solutions) to estimate continuum damping of an Alfvenic mode. In our scheme we analyze the determinant arising from attempting to match solutions at the surface of the plasma vacuum interface. A zero of the determinant corresponds to an eigenvalue of the system. When continuum damping exists in a stable system, the eigenmode cannot be calculated by an integration along the real axis (in principle integration in deformed regions of the complex plane is required). The approach we take here is to scan the value of the determinant as a function of complex frequency where the imaginary part of the frequency is positive. The analytic continuation of the determinant gives an estimate of the root in the lower half plane, from which the damping rate is extracted. A complicating factor in our procedure is that the positions of a pole and zero of a determinant is frequently comparable to the damping rate. Hence, the search procedure must account for both the zero and pole structure of the determinant. It is interesting to note that the root of the pole corresponds to the eigenvalue of the problem where an ideal conducting wall is placed on the plasma vacuum interface. We are attempting to apply our new subroutine to realistic equilibria, such as C-Mod.

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