

**Comparison of Tokamak Axisymmetric Mode
Growth Rates from Linear MHD
and Equilibrium Evolution Approaches**

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Abstract

Linear magnetohydrodynamic (MHD) and equilibrium evolution approaches describe linear and nonlinear axisymmetric displacement dynamics of free boundary plasma equilibrium configurations surrounded by conductors in an external magnetic field. A comparison of the two different approaches was made using DIII-D-like free boundary equilibria. Good agreement was found for up-down symmetric configurations. However, a considerable difference in growth rates is found for up-down asymmetric equilibria. The difference can be explained by taking into account surface current perturbations in the MHD model. Common and specific features of the two approaches are discussed.

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