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Comparison of Tokamak Axisymmetric Mode Growth Rates Linear MHD and from Equilibrium Evolution Approaches¹ S.A. GALKIN, A.A. IVANOV, S.YU. MEDVEDEV, YU.YU. POSHEKHONOV, Keldysh Institute of Applied Mathematics, Russian Academy of Sciences, Moscow, Russia, D.A. HUMPHREYS, General Atomics — The axisymmetric displacement dynamics of free boundary plasma equilibrium configurations surrounded by conductors in an external magnetic field are described by both the linear MHD and equilibrium evolution approaches. A comparison of these models was made for DIII–D like free boundary equilibria. The equilibria were ideally stable to allow comparison of the resistive growth rates. Computed growth rates from both approaches are in good agreement for configurations without perturbed surface currents (up-down symmetric equilibria). However, considerable differences were found for configurations with a perturbed surface current (up-down asymmetric equilibria), and absence of the perturbed surface current in the equilibrium evolution model can lead to overestimation of vertical displacement growth rates. Common and specific features of the two approaches and the results of the comparison are presented and discussed.

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