Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Verification of the Resistive DCON Code A.H. GLASSER, University of Washington, Z.R. WANG, J.-K. PARK, Princeton Plasma Physics Laboratory — The ideal MHD axisymmetric toroidal stability code DCON has been extended to treat resistive instabilities, with resonant surfaces at rational safety factor values of $q = m/n$. DCON solves the ideal MHD equations using a singular Galerkin method to obtain matching data for the ideal outer region. Robust convergence is achieved by a careful choice of basis functions: C^1 Hermite cubics to resolve nonresonant solutions; a high-order power series in the neighborhood of each singular surface to resolve large and small resonant solutions; distributed with a grid-packing algorith with high resolution near the singular surfaces and adequate grid to resolve the nonresonant region. The degenerate case for $\beta = 0$ has been derived and coded up for verification, in addition to the nondegenerate case $\beta > 0$. The DELTAR code computes corresponding inner region matching data for the resistive MHD equations of Glasser, Greene, and Johnson. The MATCH code matches the inner and outer region data to obtain global eigenvalues and eigenfunctions. The VACUUM provides data for a vacuum region outside the plasma region. The MARS-F code, which solves the same equations by a straigh-through method, is used to verify the accuracy of the DCON solution. Results will be presented.

A. H. Glasser
University of Washington

Date submitted: 11 Jul 2014 Electronic form version 1.4