Flow stabilization of the ideal MHD resistive wall mode\textsuperscript{1} S.P. SMITH, S.C. JARDIN, PPPL, J.P. FREIDBERG, MIT, L. GUAZZOTTO, U. Rochester — We demonstrate for the first time in a numerical calculation that for a typical circular cylindrical equilibrium, the ideal MHD resistive wall mode (RWM) can be completely stabilized by bulk equilibrium plasma flow, $V$, for a window of wall locations \textit{without} introducing additional dissipation into the system. The stabilization is due to a resonance between the RWM and the Doppler shifted ideal MHD sound continuum. Our numerical approach introduces $u = \omega \xi + iV \cdot \nabla \xi$ and the perturbed wall current\textsuperscript{3} as variables, such that the eigenvalue, $\omega$, only appears linearly in the linearized stability equations, which allows for the use of standard eigenvalue solvers. The wall current is related to the plasma displacement at the boundary by a Green’s function. With the introduction of the resistive wall, we find that it is essential that the finite element grid be highly localized around the resonance radius where the parallel displacement, $\xi_\parallel$, becomes singular. We present numerical convergence studies demonstrating that this singular behavior can be approached in a limiting sense. We also report on progress toward extending this calculation to an axisymmetric toroidal geometry. \textsuperscript{1}Work supported by a DOE FES fellowship through ORISE and ORAU. \textsuperscript{2}L. Guazzotto, J.P Freidberg, and R. Betti, Phys. Plasmas 15, 072503 (2008). \textsuperscript{3}S.P. Smith and S. C. Jardin, Phys. Plasmas 15, 080701 (2008).