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MHD spectral analysis of the resistive wall mode in a rotating plasma J.P. (HANS) GOEDBLOED, FOM-Institute for Plasma Physics, Nieuwegein, the Netherlands, JEFFREY FREIDBERG, Plasma Science and Fusion Center, MIT, Cambridge, USA — The new approach of constructing the full complex ideal MHD spectrum of stationary plasma flows (Goedbloed, PoP 16, 122110 & 122111, 2009), based on selfadjointness of the generalized force operator and the Doppler-Coriolis shift operator, is generalized to include the dissipation of resistive wall modes. The method consists of first constructing the solution path in the complex omega-plane, determined by energy conservation for the one-sided boundary value problem (open system), and next finding the eigenvalues on that path, determined by imposing the remaining boundary condition. With this split of the eigenvalue problem, the problem is perfectly suited for parallel computation. The lack of self-adjointness of the generalized force operator for the dissipative problem is accounted for by the energy dissipation in the resistive wall. The resulting different new topologies of the one-dimensional solutions paths in the complex omega-plane are analyzed and shown to yield a characterization of the different stabilizing and destabilizing effects operating in the resistive wall problem. The aim of this research is to find parameter regimes of relative stability with respect to the resistive wall mode, incorporating both toroidal and poloidal plasma flows.

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