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Selecting interfaces for Multi-region Relaxed MHD ZHISONG QU, ROBERT DEWAR, Australian Natl Univ, STUART HUDSON, PPPL, MATTHEW HOLE, MATHEW MCGANN, Australian Natl Univ — The Multiregion Relaxed MHD model has been shown to be successful in the construction of equilibria in 3D configurations. In MRxMHD, the plasma is sliced into sub-volumes separated by ideal interfaces, each undergoes relaxation. The Stepped Pressure Equilibrium Code (SPEC) has been developed to solve MRxMHD equilibria numerically. However, to date, the interfaces in MRxMHD have a degree of arbitrariness: the only requirement is that their rotational transform be sufficiently irrational. We investigate numerical and physical criteria that indicate if a certain interface should be deleted. First, an interface should not be a boundary circle, i.e. a flux surface that has chaos in its neighborhood. This leads to a numerical criterion to compute the analytic width of the interface Fourier harmonics or the Lyapunov exponent in its vicinity. The second method makes use of the pressure jump Hamiltonian (PJH) technique by studying the existence of KAM surfaces in the phase space of PJH. These results have implications for the interface selection in MRxMHD.

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