Category: 6. Magnetic confinement

Sub-Category: 6.10 Magnetohydrodynamics and stability

Presentation Type: Contributed

Category Type: N/A

Multiregion Relaxed MHD toroidal states with flow

Robert L Dewar[1,2], Zhisong Qu[1], Naoki Sato[3], Stuart Hudson[4], Matthew J. Hole[1]
[1]Australian Natl Univ, [2]MSRI Berkeley, [3]Kyoto University, [4]Princeton Plasma Phys Lab

Body:

The action-based formulation[1] of Multiregion Relaxed MHD (MRxMHD) encompasses both steady-flow statics, and dynamics on a slower timescale than Taylor relaxation. An extension of the 3D-MRxMHD-based *equilibrium* code SPEC[3] to allow plasma flow with reasonably general flow profiles is now under development, but the formulation of Ref. 1, which describes the plasma in each region as an ideal Euler fluid is too general for practical purposes as it allows all the turbulent complexity of such a fluid. This motivates seeking a relaxation model for fluids that maintains compatibility with ideal-MHD flow-equilibrium theory, at least in the axisymmetric limit.

1. R.L. Dewar, Z. Yoshida, A. Bhattacharjee and S.R. Hudson, J. Plasma Phys., **81**, 515810604-1–22, (2015).

Funding Acknowledgment:
Support from Australian Research Council Discovery Grant DP170102606 is acknowledged.

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