

Three-dimensional magnetohydrodynamic equilibria with continuous magnetic fields

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A brief critique is presented of some different classes of magnetohydrodynamic equilibrium solutions based on their continuity properties [1] and whether the magnetic field is integrable or not.

A generalized energy functional is introduced [2] that is comprised of alternating ideal regions, with nested flux surfaces with irrational rotational-transform, and Taylor-relaxed regions, possibly with magnetic islands and chaos.

The equilibrium states have globally continuous magnetic fields, and may be constructed for arbitrary three-dimensional plasma boundaries and appropriately prescribed pressure and rotational-transform profiles.

References

- [1] B. Kraus *et al.*, submitted. (2017)
- [2] S.R. Hudson *et al.*, *J. Plasma Phys.* in press. (2017)