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Expansion of a MHD equilibrium About a Magnetic Axis
HAROLD WEITZNER, New York University — Earlier work, Phys. Plasmas, 21,022515 (2014) showed that a formal expansion of a non-symmetric ideal MHD equilibrium in a topological torus was possible to all orders the parameter corresponding to the amplitude of the "helical" field components. Selected field components were not arbitrary, but had to be chosen appropriately. This analysis did not allow the toroidal domain in which the expansion was carried out to include a magnetic axis. The present work examines the nature of non-symmetric equilibria in the neighborhood of a magnetic axis in a topological toroidal domain. An expansion is carried out in the distance from the magnetic axis for two simple cases. In the first the axis is a straight line, and in the second the axis is a space curve. The expansions to all orders are carried out and conditions for the expansions to exist are given. Again for selected cases equilibria appear possible.

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