

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Non-symmetric steady ideal magnetohydrodynamic flows in a non-symmetric topological torus¹ HAROLD WEITZNER, WRICK SENGUPTA, New York University — Previous work, Phys. Plasmas 21,022515 (2014) on expansions of ideal magnetohydrodynamic equilibria in a topological torus is extended and modified to allow the addition of steady flows of leading order in the formal expansion parameter. The leading order flow and magnetic field depend on one coordinate direction only and have components in the other two coordinate directions. It is shown that an expansion can be carried out to all orders in a parameter which measures the amplitude of the “helical” flows and fields. Resonances appear, but can be resolved exactly as in the previous work by the addition of appropriate lower order flows and fields. The resonance conditions involve two different linear combination of the lowest order flows and fields. As in the earlier work the elimination of the resonances requires that the boundaries of the domain of the steady flow be chosen correctly. Although the the expansion may be carried to all orders, convergence is not proven.

¹Work Supported bt DE-FG-02-86ER53223

Harold Weitzner
New York University

Date submitted: 14 Jul 2017

Electronic form version 1.4