

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

MHD collimation and kink instability driven by differential rotation CHRISTOPHER CAREY, CARL SOVINEC, University of Wisconsin — Recent observations of astrophysical outflows from active galactic nuclei suggest that these jets are permeated with helical magnetic fields. We are conducting simulations that are relevant to these jet systems using the NIMROD MHD code. In these simulations an initial seed field is twisted by a differentially rotating flow boundary condition. The zero beta axisymmetric nonlinear system is considered. The degree of collimation in this system is shown to depend on the ratio of the Alfvén velocity in the domain to the driving velocity on the boundary. Non-axisymmetric linear eigenmodes of the collimated axisymmetric results are calculated. It is shown that an external force, provided by an outer boundary in the simulations discussed here, is necessary for growing Eigenmodes. By comparing to simulations of kink modes in a paramagnetic pinch, it is shown that these growing Eigenmode solutions are indicative of the kink mode.

Christopher Carey
University of Wisconsin

Date submitted: 31 Jul 2006

Electronic form version 1.4