

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

3D MHD Simulations of Large-Scale Structures of Magnetic Jets

HUI LI, GIANNI LAPENTA, JOHN FINN, SHENGTAI LI, Los Alamos National Lab — Extragalactic radio jets represent a significant amount of magnetic energy (and perhaps magnetic flux) flow from supermassive black holes inside massive galaxies to the intergalactic medium (IGM). Magnetic fields are believed to play an important role in determining the overall structure of astrophysical jets, though many fundamental questions remain, such as what collimation mechanisms are, what determines the lobe formation, etc. We will present 3D MHD simulations of the formation of large scale magnetic jets/“towers,” evolved from an isolated and idealized initial state where magnetic fields are injected in a small volume. We will present a detailed analysis of the “tower” structure, collimation mechanisms, instabilities, and flux conversion processes. We will also compare our simulation results with astrophysical jet observations.

Hui Li
Los Alamos National Lab

Date submitted: 25 Jul 2005

Electronic form version 1.4