

Abstract Submitted
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Global Constraints on Astrophysical Jet and Lobe Systems from the Jet and ICM Interactions HUI LI, LANL, HAO XU, LANL/UCSD — X-ray and radio observations of galaxy clusters have revealed a wealth of structure in the intra-cluster medium (ICM) associated with extragalactic radio sources. Structures in the form of large scale cavities and weak shocks provide a reliable gauge of the mechanical output of extragalactic radio jets launched by AGNs. By analyzing the properties of the jet/lobe and ICM interactions, we discuss how these observations can give strong constraints on the nature of AGN outflows. We present three-dimensional relativistic MHD simulations of the jet/lobe formation and its interactions with the background ICM. The jet/lobe formation is determined by a global current system. We investigate the effects of flows on the energetics and stability of the jet-lobe system. Simulations are compared with observations of X-ray cavities in clusters and the possibility of lobes being magnetically dominated on global scales will be discussed.

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