Chandra Observations of the Lensing Cluster EMSS 1358+6245: Implications for Self-Interacting Dark Matter

J.S. Arabadjis, M.W. Bautz (*MIT*), G.P. Garmire (*Penn State*), G. Ricker , C.R. Canizares (*MIT*)

Abstract

We present Chandra observations of the EMSS 1358+6245, a relaxed cooling flow cluster at $z = 0.328$. Exploiting the spatial resolution of the Chandra and the imaging spectroscopy capabilities of the ACIS detector we employ a new deprojection technique to construct temperature, gas, and dark matter profiles. Our deprojected temperature profile is consistent with isothermality over 30 kpc $< r <$ 0.8 Mpc. We find good agreement between our dark matter profile and gravitational lensing measurements. We use the mass profile near the center of the cluster to constrain the cross section of possibly self-interacting dark matter.

CATEGORY: CLUSTERS OF GALAXIES