Chandra Observation of the Radio Source / X-ray Gas Interaction in the Cooling Flow Cluster Abell 2052

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Abstract

We present a Chandra observation of Abell 2052, a cooling flow cluster with a central cD that hosts the complex radio source 3C 317. The data reveal "holes" in the X-ray emission that are coincident with the radio lobes. The holes are surrounded by bright "shells" of X-ray emission. The data are consistent with the radio source displacing and compressing, and at the same time being confined by, the X-ray gas. The compression of the X-ray shells appears to have been relatively gentle and, at most, slightly transonic. The pressure in the X-ray gas (the shells and surrounding cooler gas) is approximately an order of magnitude higher than the minimum pressure derived for the radio source, suggesting that an additional source of pressure is needed to support the radio plasma. The compression of the X-ray shells has speeded up the cooling of the shells, and optical emission line filaments are found coincident with the brightest regions of the shells.

CATEGORY: CLUSTERS OF GALAXIES