Cosmological Clusters: Chandra and Sunyaev-Zel'dovich Estimates of the Baryon Fraction in a Luminous X-ray Cluster at z=0.5

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[Contributed talk, 15min.]

Abstract

I will briefly review the improved EMSS high redshift temperature function based on new Chandra cluster temperatures, and its impact on cluster cosmological parameters.

I will describe our Chandra observations of the cluster MS0451-0321, which, at z=0.5, is the most luminous cluster in the EMSS. We determine the cluster gas density distribution, gas mass fraction, and preliminary constraints on the universal baryon mass fraction, Ω_M/Ω_b, from a maximum likelihood joint fit to the interferometric Sunyaev-Zel'dovich imaging data and Chandra X-ray observations. The spatial resolution of Chandra allows us to explore the variations in the hot gas density distribution from a standard 2-D elliptical data profile, as well as deviations from isothermality in the gas temperature. By doing a joint fit we are able to limit the amount of clumping allowed in the gas; our X-ray imaging analysis also places estimates on the level of substructure in the gas distribution.

We also discuss the X-ray point source in the field coincident with a SCUBA/submm source and a cluster radio source.

CATEGORY: CLUSTERS OF GALAXIES