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# Measuring the 3D shape of galaxy clusters

Clusters of galaxies are increasingly exploited as cosmological probes. For accurate measurements of cluster properties it is extremely important to constrain the three-dimensional shape of clusters. If non-spherical components of the X-ray emitting intracluster gas are not taken into account, it is very likely that one will obtain erroneous estimates for cluster mass and gas properties. We propose a novel method for constraining the true 3D shape of galaxy clusters, modeling the emission of the hot intracluster gas. By adding new degrees of freedom to the X-ray emission models, we are able to differentiate between the case of a spherically symmetric cluster and one that is elongated along the line of sight. This differentiation can not usually be made using ordinary lensing data or simplified X-ray emission models. The method is applied to mock Chandra data, enabling accurate measurements of total cluster mass along with gas temperature and density profiles. In the future it will be extended to real data and, combined with alternative methods for cluster parameter estimation, provide a valuable future asset in the toolbox for precision cosmology using large scale structures.

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