

Referee report

Article ApJS/295532/ART

ID:

Title: Intracluster Medium Entropy Profiles for a Chandra Archival Sample of Galaxy Clusters

Edited V2

The authors have made revisions which are substantially in accord with my suggestions. However, I have some further minor comments on their interpretation of the XMM results presented in Sect 5.6.1 which I would like to see addressed before finally recommending publication. The comments are again meant to be taken in a positive light, and I believe if that if they are taken into account the quality of the scientific discussion in this and subsequent work will be improved.

In my original report I noted that the application of different analysis methods to the data produced entropy profiles with different resolutions. The point I tried to make was that in the absence of any constraints on the temperature structure, it is the density profiles which drive the form of the entropy profiles. Thus, for a given surface brightness profile, provided PSF effects are accounted for, there are situations where there should be little to choose in terms of resolution between an XMM and a Chandra density profile. This is particularly true given that the surface brightness profiles in the present paper are produced using 5" annular bins, which is nowhere near the resolution limit of Chandra and is well within the resolution limit of XMM provided PSF effects are accounted for. I mentioned that proof of this can be seen in Croston et al. (2006).

The authors have responded to my comment by expanding the first part of Sect 5.6.1 accordingly; however, by paragraph 4 of Section 5.6.1, the authors have reverted to making generic statements concerning the angular resolution of XMM which are at odds with their statements in the previous paragraphs of the same Section.

To my mind, there are two key factors in the present Chandra analysis that have allowed the authors to draw conclusions over and above those which were drawn from the previously published XMM data:

- a) the extrapolation of the entropy across the central temperature bin, which was not considered by the previous XMM analyses, which allows the authors to overcome limited temperature resolution in the central regions, and which I believe the authors have convincingly demonstrated does not impact their results;
- b) the use of a power law plus constant to model the entropy distribution in the core regions, which was again not attempted with the XMM analyses and which gives rise to the discovery of the bimodal distribution of K0.

Neither of these factors is significantly dependent on the angular resolution precisely because of the fact that it is the density profiles which drive the entropy, and not the temperature profiles, and at least some XMM analyses have density profile resolution which is very near to that available from Chandra.

Couching the discussion at the end of Section 5.6.1 in terms which could easily be interpreted as degrading the resolution to that of XMM does not do justice to either the present analysis or the preceding XMM analyses. Thus my belief is that Section 5.6.1 should be rewritten to avoid the generic discussion regarding XMM resolution, and should make an effort to reflect the more nuanced points I have discussed above.