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XMM-Newton observations of elliptical galaxies in the local universe

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XMM-Newton is well suited to the study of the X-ray properties of early-type galaxies: the wide energy band allows a characterization of the different components of the X-ray emission in galaxies, separating the gas from the compact source component through their spectral characteristics, and identifying low-luminosity absorbed AGNs; the large field of view allows a proper understanding of the large scale emission, and the separation between the galaxy and the surrounding group. Nonetheless, in spite of the much improved understanding of the X-ray characteristics of this class of sources, much of the original questions on the global X-ray properties of early-type galaxies remain. One in particular: how can we predict how much gas is there in any given galaxy? We have learned that the individual sources are tightly linked to the stellar component, both field stars and relative frequency of globular clusters. We have also learned that the central group galaxies, brighter and more extended, might represent a specific class of early-type galaxies, rather than the population as a whole. Yet we have not learned how to predict, from the stellar properties, how much hot gas a galaxy will have. Even a well selected class of sources, namely early type galaxies in isolation, where we can exclude the influence of the environment, appear to retain different amounts of the hot ISM produced by the stellar population, and display a wide range of L_x for their gaseous component for a relative narrow range of L_b, or mass [measured through L_K], as shown by Fig. 1.

Keywords. galaxies: halos; elliptical and lenticular; intergalactic medium

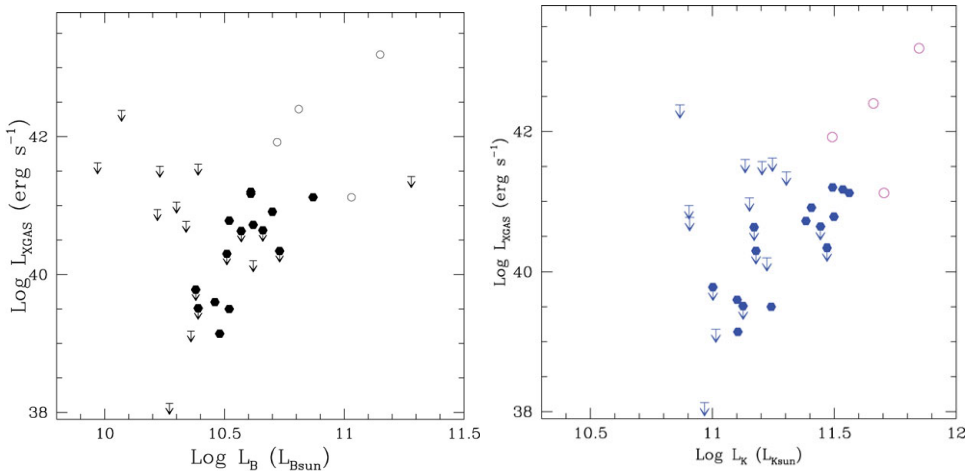

Figure 1. Comparison between the hot gas X-ray luminosity and B-band (left) or K-band (right) luminosity for isolated galaxies. "Fossil groups", namely isolated galaxies that have been found associated to a large, group-size halos, are identified by open circles. Arrows identify upperlimits to the total emission, or gas emission when associated with a symbol.