Amato, Roberta – IFC/INAF
A. D'Aì, T. Mineo, M. Del Santo

Characterization of the X-ray population and background of M22: the ATHENA view

Globular Clusters (GCs) are among the oldest astrophysical objects in our Galaxy. Mainly, they consist of a II population stars and of a significative number of compact objects, especially White Dwarfs and Neutron Stars. The high density of stars in these systems gives rise to alternative channels of formation of X-ray binary systems, such us three-body interaction and tidal capture. Thus, GCs constitute an extraordinary rich environment for studying the physics of mass accretion onto compact objects.

M22 is one of the most luminous GC in the Milky Way. Several X-ray observations have been performed over the last decade, even though a systematic and comparative study among all available data has not yet been done. We aim to classify and characterize the M22 X-ray population, by using archival observations from Chandra, XMM-Newton and Swift/XRT telescopes. In particular, Swift/XRT has carried out a dedicated monitoring of the cluster during the last two years, allowing us to study the variability of the brightest sources and to compare these new observations with the past ones.

We find about sixty X-ray sources, forty of which are not yet classified. We study their distribution inside the cluster and from a detailed spectral analysis we propose their classification. Finally, we make a spatial analysis of the cluster background, studying its radial distribution.

The future X-ray mission ATHENA, which is going to observe also faint sources in our Galaxy, is the ideal instrument to observe GCs and to give more stringent constraints on their sources population. In fact, the higher ATHENA spectral resolution and the lower background level will improve the quality of the data, allowing an unprecedented detailed analysis of such crowded environments. We explore the expected ATHENA performances in this field by simulating the images of the whole cluster and the spectra of a sample of sources.