

H-alpha Imaging of X-ray Sources in Selected Globular Clusters with the SOAR Telescope

Pawel Pietrukowicz

Abstract

We present results of a search for objects with H-alpha excess, such as cataclysmic variables (CVs) and chromospherically active binaries (ABs), as counterparts to X-ray sources detected with Chandra satellite observatory in six Galactic globular clusters (GCs): M4, M28, M30, M71, M80, NGC 6752. Binary systems play a critical role in the evolution of GCs, serving as an internal energy source countering the tendency of GC cores to collapse. Theoretical studies predict dozens of CVs in the cores of some GCs (e.g., 130 for M28, 40 for M30). A number of such binaries is also expected outside the core radius. However, few CVs are known so far in GCs. Using subtraction technique applied to images taken with the 4.1-m SOAR telescope we have found 27 objects with H-alpha excess in the field of the observed clusters, of which nine are likely associated with the clusters. Four are candidate CVs, four candidate ABs, one could be either a CV or an AB. One H-alpha object seems to be a background galaxy, while other 17 detected objects are probably foreground or background stars.