

ASCA Observation of Low Mass X-ray Binary X1254-69*

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We present the results of ASCA observation of low mass X-ray binary X1254-69, which is a dipping and bursting source. The spectral fits using a model power law with exponential cutoff give photon index $\alpha=0.97 \pm 0.04$ and absorption column density $N_{\text{H}}=(2.54 \pm 0.08) \times 10^{21} \text{ cm}^{-2}$. These are very similar to that of observed by EXOSAT. In addition, we find also that the calculated flux, $\sim 8.1 \times 10^{-10} \text{ ergs cm}^{-2}\text{s}^{-1}$, is comparable with the results of EXOSAT in the same energy band of 1-10keV. However, no significant features associated with the intensity dip as well as with the burst are detected in the present observation. This means the depth of the dip is highly variable. We suggest that the size of blocking material is not related in a simple manner to the mass accretion rate.

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X-Ray and Optical Light Curves of the Magnetic Cataclysmic Variables

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Magnetic cataclysmic variables consist of a mass-donating late type main sequence star and a mass accreting white dwarf. Using a phenomenological model of Kim & Beuermann (1995) we consider the propagation of the emitted X-ray radiation through the magnetosphere of the reprocessing of this X-rays by photoabsorption in the optical spectral range. Our results show that X-ray and optical modulation sensitive to model parameters and this dependence can be used to obtain improved insight into the geometry of such systems.

CCD Photometry of the Globular Clusters M13 and M71

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We present deep CCD photometry in the B and V filter bands for two globular clusters, M13 and M71. Observations were made on October 1994 and March 1995 using the Mauna Kea 2.2m telescope with 2048 \times 2048 CCD. Using the DAOPHOT

CCD reduction package, we obtained Color-magnitude Diagrams(CMDs) with well defined main-sequences extending to $V=23(M71)$ and $V=25(M13)$, respectively. In order to investigate the age spread among globular cluster, we will compare these CMDs with those of 47 Tuc and M3.

Washington CCD Photometry of Globular Cluster in NGC 4472

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Globular cluster in giant elliptical galaxies provide us with important clues for understanding the formation and evolution of globular cluster as well as their parent galaxies. NGC 4472 (M49) is the brightest elliptical galaxy in the Virgo cluster and has a rich globular cluster system.

We present a study of the metallicity of a large sample of globular cluster in NGC 4472. Deep Washington CT_1 photometry of a wide ($16' \times 16'$) field of NGC 4472 was obtained using Tek 2048 \times 2048 CCD at the KPNO 4m telescope.

The color-magnitude diagram (T_1 vs $(C-T_1)$) of $\sim 9,500$ measured point sources show 1) two strong vertical structures in the color range of $1.0 < (C-T_1) < 2.3$ which consist mostly of globular cluster, and 2) a dominant horizontal structure fainter than $T_1=23$ mag most of which are unresolved faint background galaxies.

We have estimated the metallicity of $\sim 1,400$ globular cluster brighter than $T_1=22.5$ mag from the $(C-T_1)$ colors. The metallicity distribution of the bright globular cluster shows two strong peaks at $[Fe/H]=-1.3$ dex, and possibly two peaks at $[Fe/H]=+0.3$ and $+0.9$ dex. The metal-rich globular cluster are spatially more concentrated than the metal-poor globular cluster. The mean metallicity of the globular cluster is decreasing as the galactocentric radius increase, similarly to that of M87. These results are consistent with the merger hypothesis for the formation of giant elliptical galaxies.

The luminosity function of giant of the globular cluster shows clearly a peak at $T_1=23.3 \pm 0.1$, from which we derive a distance modulus of $(m-M)_0=31.2 \pm 0.2$ mag ($d=17.4 \pm 1.6$ Mpc). Using this value for the distance, we estimate the Hubble constant to be $H_0=66 \pm 14$ km/s Mpc for the mean velocity of the Virgo $v=1179 \pm 17$ km/s (Sandage & Tammann 1993) and $H_0=79 \pm 17$ km/s Mpc for the velocity $v=1404 \pm 80$ km/s (Huchra 1988).