Near Infrared Survey of the Nuclear Regions of the Milky Way

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Abstract. Results based on the deep imaging survey of the inner region ($\sim300pc$ of the bulge within $|\ell| \sim 1.5°$, $|b| \sim 0.5°$) of the Milky Way are reported in this communication. This survey is about 2.5 magnitude deeper than DENIS and 2MASS and is able to detect stars of the red clump at a distance of the Galactic center. Toward some directions we find extinction reaching $A_V = 50$ mag. A catalog of the sources is in preparation.

Keywords. Milky-way, interstellar extinction, Galactic Bulge

1. Introduction

In the recent past there have been several NIR surveys, e.g.DENIS, 2MASS. Due to poor spatial resolution, these surveys suffer from confusion and hence lack depth in the high number density nuclear region of the Galaxy. The interstellar extinction for the inner Galactic Bulge is detected to be > 25mag with a clumpy, inhomogeneous nature(Schultheis *et al.*, 1999 A&A, 349, L69). A large number of K_S sources do not have counterparts at shorter wavebands in DENIS and 2MASS. To overcome these problems, and to gain a better understanding of the distribution of stellar populations in the nuclear bulge region, we carried out deep imaging survey of the inner region in J, H & K_S bands using IRSF telescope, SAAO, Sutherland, during June-July 2002 (for details see Baliyan *et al.* 2003 ANS, 324, p47).

2. Results

We use 0.1sec exposure data to plot CMDs: $J - K_S$ vs K_S (fig 1) and $H - K_S$ vs K_S (fig 2) for 9 locations around (RA=17:48, DEC=-28:20). All the figures are in the online section. Note that the number of sources detected in both H and K_S is much larger than that detected also at J. In fig 3 ($H - K_S$ vs K_S for GC1748-2820F) we have also shown the red giant isochrones at different A_V ranging from 30 to 50 mag. With the longer integration data we estimate and quantify accurately the extinction to much deeper values. Final products - a Catalog of ~3 million sources with extinction and stellar population identification and an extinction map towards the Nuclear Bulge, will be published shortly.

Acknowledgements

3. Online Section
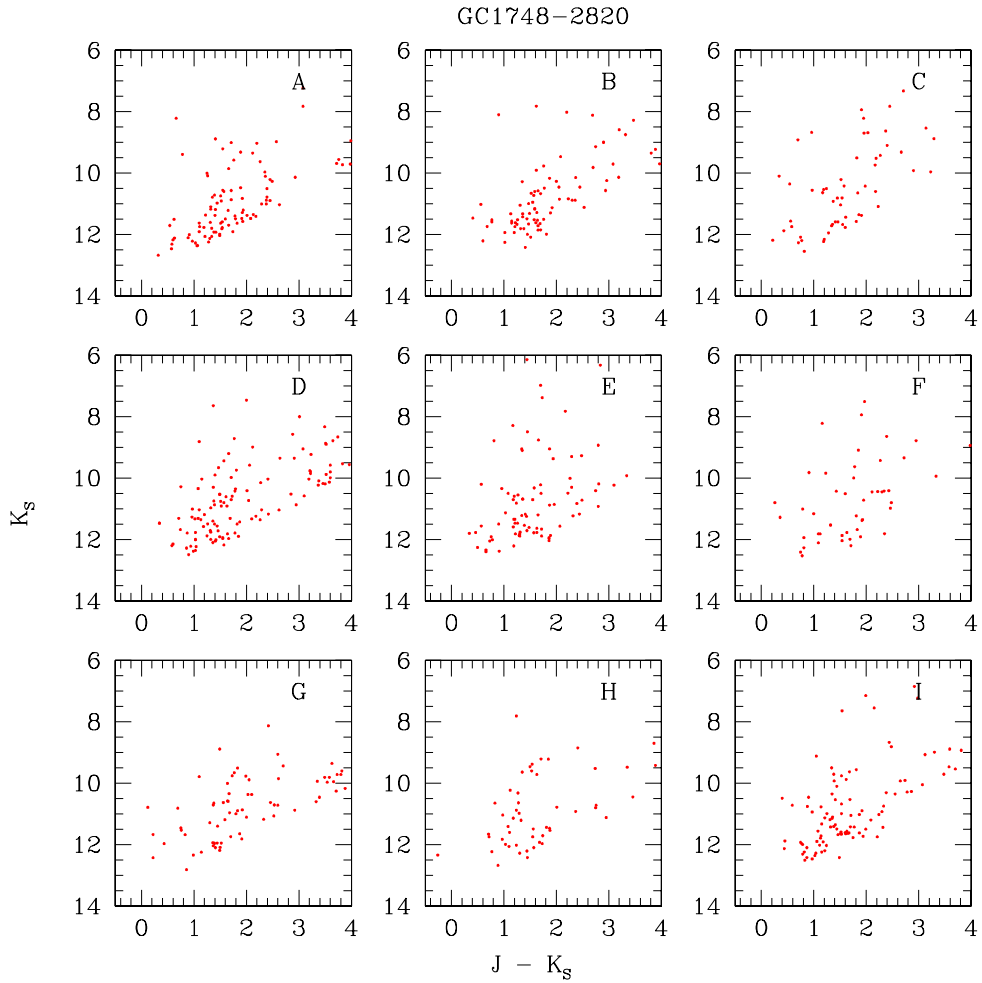
Figure 1. K_S vs $J - K_S$ for 9 locations around RA=17:48 and DEC $= -28$:20.
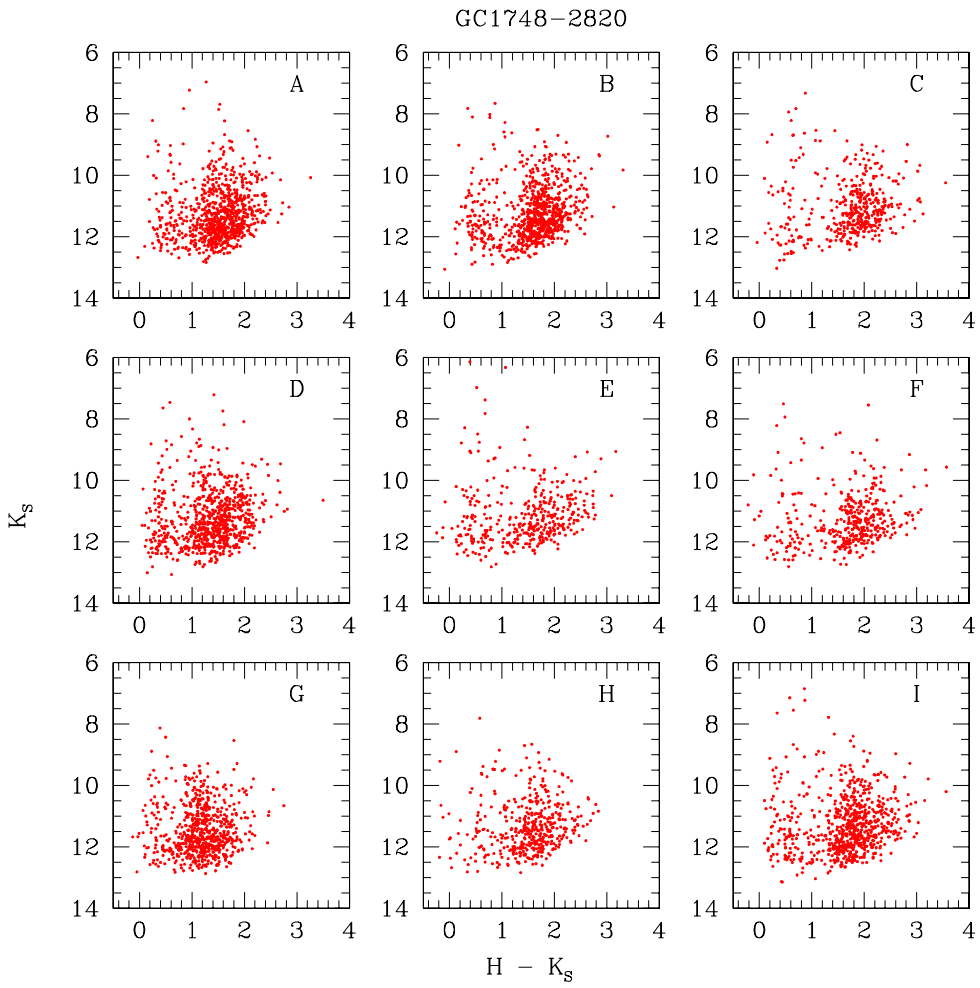
GC1748−2820

Figure 2. K_S vs $H - K_S$ for 9 locations around RA=17:48 and DEC $= -28$:20.
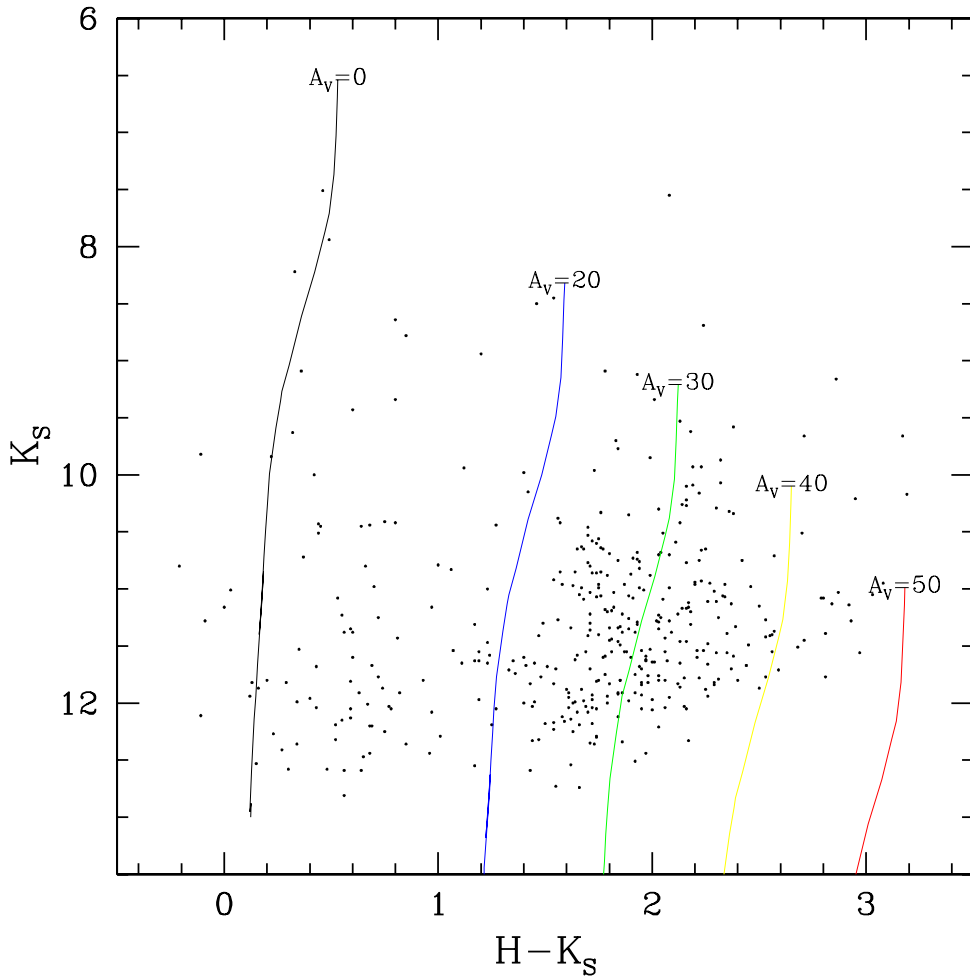
GC1748−2820F

Figure 3. K_S vs $H − K_S$ for one location towards RA=17:48 and DEC $= −28$:20 with red giant isochrones overplotted at various A_V.