A COMPARISON BETWEEN A COLOR EVOLUTION MODEL AND A NEW SAMPLE OF LMC CLUSTERS: FORMATION RATE

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We present a preliminary comparison between a photometric cluster model and the enlarged sample of 624 LMC clusters recently observed in integrated UBV photometry by Bica et al. (1991). The model was computed with Maeder and Meynet (1991) isochrones in the mass range 120 – 0.8 $M_\odot$ with $Z_\odot$, and complemented down to 0.15 $M_\odot$ with VandenBerg et al. (1983) models. It includes all the essential phases of stellar evolution up to $\sim$ 1 Gyr, but lacks the HB and AGB phases for low mass stars. We considered IMF slopes x = 2.5 and 1.35, encompassing results from recent CCD data for LMC clusters (Richtler et al. 1991). The red supergiant (RSG) phase (t = 10 Myr) was reproduced on the observed diagram $(U-B)$ vs $(B-V)$, although shifted to the red by metallicity and/or mass loss effects. x = 2.5 describes better the RSG phase for the clump of massive clusters. On Fig. 1 the theoretical fading lines for x = 1.35 and 2.5 are superimposed on the data in the plane V vs. $\log t$ (SWB types). Mass strips are limited by fading lines corresponding to different cluster masses. We estimated the cluster formation rate (CFR) $\Delta N/\Delta t$ in two different ways (Fig. 2): 1) By counting the clusters in age bins in mass limited strips as shown in Fig. 1. 2) By counting the clusters above the observational cutoff at $V \simeq 13$, and correcting by the number of clusters below the cutoff which should be encompassed by a fading line starting at V = 13 for the youngest age bin. Fig 2. provides a comprehensive estimate of the CFR, although affected by dynamical effects such as evaporation of stars and tidal disruption (Wielen 1988). More work is necessary to disentangle the two effects.

Figure 1:

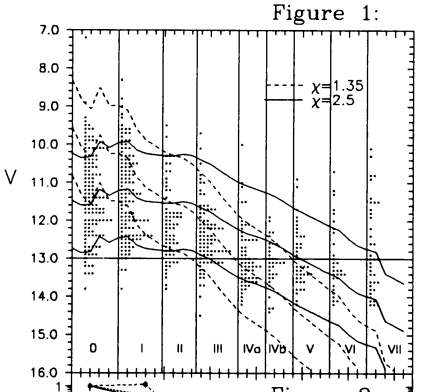
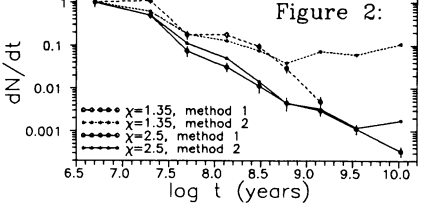


Figure 2:



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