BAADE'S WINDOW PHOTOMETRY AND SPECTROSCOPY

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An infrared scan of the Baade's Window (BW) is obtained. The cumulative K-counts function (hereafter CCF, which is the number of sources per square degree down to K = +13.5) is formed by combining 1.9m telescope scans with AAT scans. With the aid of a theoretical exponential disk model (e.g., Ruelas-Mayorga, A., Rev. Mex. Astr. Astrof. 22, 43, 1991) and observations at l = 20^o, b = -5^o, we decompose the observed CCF into disk-CCF and bulge-CCF components. The bulge CCF is steeper than the disk CCF in the range K = (+5.0,+11.0) showing a relative depletion of high mass stars with respect to the disk. The bulge CCF is compared with derived CCF's for the globular clusters 47 Tuc, M92, M3 and M13 and the open cluster M67. The similarity of the slope of the bulge-CCF to those of the globular clusters suggests that the stellar population of the bulge may be similar in age and perhaps also in metallicity characteristics of the stellar populations in globular clustes. Photometric studies of a bright-K subsample: 165 of the 578 sources found in BW down to K = +11.0 are made. Several sources with mild IR-excesses are found, and through spectroscopy, were confirmed to be Miras variables. The reddening E(J-K) = +0.27 agrees well with the value E(B-V) = +0.45 obtained by optical techniques. In a HR diagram most of the sources in our photometric subsample lie above the giant branch tips of ω Centauri, 47 Tuc and M92. If the giant branches (GB) of these clusters are extrapolated to higher K brightnesses, a sizeable fraction of our sample would lie between them. This also suggests that their metallicity may lie in the range between that of M92 and 47 Tuc. For those sources with redded J-K colours than the 47 Tuc GB, and with magnitudes brighter than K = +8.5, even higher metallicities are required.

Besides the photometric observations, spectroscopic CO and water observations of a sample of sources in the BW were obtained. We find it is convenient to divide the BW stars into groups according to the strengths of their CO bands. It is shown that those stars with normal and strong CO bands may be consistently interpreted as disk stars. We suggest that the CO weak stars may be true bulge members. The relative numbers of CO weak objects relative to the total number of stars is consistent with the bulge and disk CCFs data (see also Ruelas-Mayorga, A., Teague, P.: 1991, A&A, in press).

https://doi.org/10.1017/S0074180900121497 Published online by Cambridge University Press