Red Stars in the LMC

Another method to discriminate between the population I and II stars in the Magellanic Clouds is to search for red stars with (B-V) $> 1^m.3$. Such red stars have different absolute magnitudes depending on their evolutionary status and therefore on their age. The extremely young, red stars are *supergiants* with absolute magnitudes $-6^m \leqq M_V \leqq -4^m$, or *subgiants* with $0^m < M_V < +7^m$ in the pre-main sequence evolutionary stage. In contrast, the reddest population II objects are *giants* with $M_V \sim -2^m$.

Red stars are easily found in a blink comparator by intercomparing U-plates with V-plates, which have nearly the same limiting magnitudes for A-type stars. In a first pilot survey, I blinked an ESO Schmidt U- and V-plate set along a small strip in the E-W direction, crossing the bar and the 30 Doradus complex. Hundreds of red stars were found by this method; they are especially numerous in and around the 30 Doradus nebula.

Globular Clusters

Finally, I should like to report about my study of globular clusters in the LMC. In contrast to the Galaxy where the globular clusters represent the oldest known stellar population and in which the brightest stars are red giants, very populous and young clusters have also been found in the Magellanic Clouds. Their brightest stars are blue supergiants and main-sequence objects. These enigmatic "blue" populous stellar aggregates have the same geometrical appearance as the "red" globular clusters which are quite numerous in the MC's. Obviously the formation of such rich clusters is still going on in the MC's, whereas this process died out long ago in the Milky Way and in other giant galaxies.

By studying the spatial density distribution of stars in globular clusters of very different age we may perhaps learn something about this mechanism and, above all, about their dynamical age status. The relaxation time of globular clusters is typically about $2 \cdot 10^9$ years, which is $^1/_{10}$ the age of the "red" globular clusters. These should therefore show a non-isothermal density distribution, contrary to the "blue" globular clusters, because the ages of the latter are only about $^1/_{100}$ of their relaxation time. Observationally the density distribution of spherical stellar systems can be obtained by star counts or surface photometry along parallel strips. Strip counting has now been carried out on V and B ESO Schmidt plates for two "blue" and two "red" globular clusters of the LMC. The first results indicate that differences are present in the density distribution between the two types of globular clusters.

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