

THE LMC GLOBULAR CLUSTER HODGE 11 (=SL 868)

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The age of the star cluster H11 has been controversial for a number of years. The color-magnitude diagram (CMD) of Walker (1979) to $V=21.5$ was interpreted as an "...evolved main-sequence, whose termination point corresponds to an age of about 0.6 Gyr, but with a giant branch which is displaced blueward by about $\Delta(B-V)_0=0.4$ from the positions of the giant branches of open clusters of similar age in our Galaxy." On the other hand, the integrated colors are similar to those of metal-poor globular clusters in the Galaxy (Freeman and Gascoigne 1977, and references therein), and "...incompatible with an age of say 0.3 Gyr." Searle, Wilkinson and Bagnuolo (1980) classify it as Group VII, the oldest group. The system has no RR Lyrae stars (Graham and Nemec 1984).

To settle the age question, deep CCD exposures in B and V to $V=23.5$ were taken of the cluster and of a neighboring field with the CTIO 4-m telescope in Dec. 1982 and Feb. 1983. CMDs have been measured in the $3 \times 5'$ fields with a point-spread-function fitting technique (Mould and Shortridge 1983, private communication) at the DAO for a pair of frames containing the cluster at one end (>1500 stars) and for a pair covering the field $30'$ N of the cluster (>1000 stars). The frames were calibrated with observations of standard fields. The upper row of Fig. 1 contains the CMDs for: a) the portion of the frame containing the cluster; b) the field portion of that frame; and c) the difference between a) and b). Fig. 1c is morphologically like metal-poor Galactic globulars with pronounced blue horizontal branches. $\Delta V(\text{horizontal branch to turnoff})$ is >3.0 mag, which is also indicative of great age. Walker's low inferred age arose naturally from: 1) his shallower CMD, and 2) the lack of data for a comparison field in this crowded region. The latter data particularly reveal that the field star component was easily mistaken for the upper main sequence of a much younger cluster.

The lower row of Fig. 1 contains CMDs from the field $30'$ N for: d) the entire $3 \times 5'$ area; e) the upper half of the frame; and f) the lower half of the frame. There is general similarity between Figs. 1b and 1d, with both indicating the presence of a wide range in ages, presumably comprised of stars younger than NGC7789 to stars older than

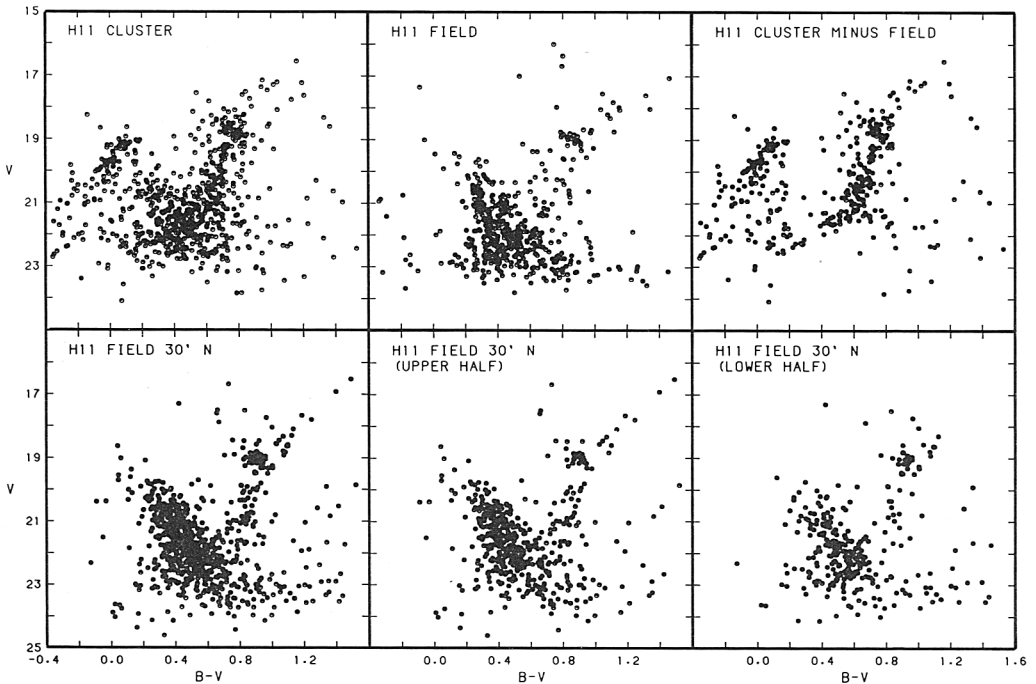


Fig. 1. Preliminary CMDs for the cluster (upper) and field (lower) frames.

those in M67/NGC188 in the Galaxy. The spread in color of the giants seems to indicate a range in $[Fe/H]$, as well. The sharply defined giant branch in the field region of Fig. 1e is quite remarkable. At the same time the differences between Figs. 1e and 1f, which occur over $\sim 2'$ (or ~ 30 pcs), are reminders of the care necessary when generalizing to global properties of the Magellanic Cloud field star populations from studies of small fields.

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