

EVIDENCE FOR NON-HOMOGENEITY IN THE METAL ABUNDANCES OF STARS
IN GLOBULAR CLUSTERS

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Evidence for non-homogeneity in the metal abundances of giant stars in various globular clusters is reviewed. The non-homogeneity is of two kinds: (1) differences in the value of $[\frac{A}{H}] \equiv \log (\frac{A}{H})_* - \log (\frac{A}{H})_{\odot}$ from star to star in the same cluster, for particular values of A, and (2) non-constancy of the cluster mean value of $[\frac{A}{H}]$ as a function of A. Observational evidence for the existence of variations of both kinds is cited, and discussed for four "nucleosynthetic" groups of elements: viz., s-process, Fe-peak, α -process, and CNO. The rival hypotheses of core-envelope mixing and primordial abundance variations are examined in the light of the observations.

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DISCUSSION

BELL: Rodgers' calibration of ΔS in terms of $[Ca/H]$ contains some approximations which can be improved and a preliminary calibration by Manduca and me reduces the $[Ca/H]$ value for a given ΔS by about -0.6 .

KRAFT: That's good - I'm very happy to hear this.

LLOYD EVANS: Radial velocities in M22 show that stars with strong metal lines and stars lying to the blue of the giant branch (brighter than the Cepheid V 11) are field stars. Discussion of the photometry shows that the width of the giant branch is largely accounted for by observational error.

RENZINI: One brief comment on the CNO abundance determination by direct observations: C and O are primary elements while N is mostly secondary. Just for this reason one may expect quite large fluctuations of the nitrogen abundance. Therefore, the really important elements to observe for getting the CNO abundance are C and O, even if this is a difficult job.

RUBIN: When do you foresee that there will be enough data to examine the metal variation in globular clusters as a function of dynamical and geographical properties?

KRAFT: I suppose a few years - one really wants to know CNO as well as the Fe-peak, and this may take some time, especially if we want reliable values.