

INWARD DIFFUSION OF HELIUM IN HORIZONTAL-BRANCH
STARS OF GLOBULAR CLUSTERS

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The diffusion process of helium was studied in evolutionary star models. A typical horizontal-branch (HB) star ($M=0.53 M_{\odot}$, $Y=0.3$, $Z=0.001$) was evolved up to the beginning of the asymptotic giant-branch phase. Helium was shown to diffuse inwards in the atmosphere and subatmosphere in a rather short interval of time. Therefore the suggested efficiency of diffusion in explaining the helium deficiency in old B- and HB-stars in globular clusters received a significant support. In models where the surface convection is not efficient enough to restore the original helium content in the outermost stellar layers, stars in subsequent evolutionary stages (such as blue and white dwarfs) should still be deficient of helium.

A comparison between the evolutionary tracks obtained with and without diffusion was made. It turned out that differences showed up from the beginning of the HB phase and remained during the whole phase. However, when studied in the color-magnitude diagram, such differences did not appear large enough to lead to substantial photometric effects. At the moment, the mentioned features should rather be detected by means of spectroscopic analysis.