

A Morphological Study of Asymptotic Giant Branch of the Globular Clusters : M3 and M13

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Wide field BVI CCD observations for M3 and M13 were carried out with 1.8m telescope at Bohyun Optical Astronomy Observatory equipped with SITE 2 K CCD. We present color-magnitude diagrams of M3 and M13 and have identified the RGB bumps by the slope changes of the integrated luminosity functions. The positions of the RGB bump are found to be $V = 15.65$ for M3 and $V = 14.70$ for M13 respectively. The ratio of the asymptotic giant branch stars to the horizontal branch stars, R_2 and the ratio of the horizontal branch stars to the red giant branch stars, R' are also found. However, the R_2 of M13 is larger than that of M3 and R' of M13 is smaller than that of M3, which are opposite to the predictions of the canonical theory. With an extra "deep mixing" during the RGB state in M13 could explain these anomalies, implying that the "deep mixing" is another possible candidate for second parameter.