ABSTRACT

We present refined BV I light curves for six field RR Lyrae variable stars. The refinements include new data and improved photometric calibration compared to our previous work. For each star, we derive the intensity-mean magnitudes, light amplitudes, and colors at minimum light. We combine our results with literature data to estimate the mean, dereddened RR Lyrae color at minimum light to be (V-I)_{0,min} = 0.58 \pm 0.02 mag with a star to star scatter of 0.024 mag. Any dependence of color on metallicity is too weak to be formally detected with the available data. One of our stars exhibits the Blazhko Effect. The star’s minimum light color is unchanged at the two observed phases of the star’s Blazhko cycle, while the maximum light color changed significantly. This insensitivity further supports the reliability of minimum light (V-I) colors as a tool for measuring interstellar reddening.

OBSERVATIONS AND REDUCTIONS

Images were obtained at the 0.9-m telescope at the Cerro Tololo Inter-American Observatory (CTIO) on six nights over 2002 January 22-27. The Ten24 CCD camera was used and frames were selected to reproduce the Krom-Cousins I and Johnson B and V passbands. Each time the telescope was pointed to a particular variable, a BV sequence of images was obtained.

In the previous study done by Day et al. (2002) the CTIO Schmidt telescope was used, which provided a larger field of view than the 0.9-m. Although the larger field of view provided the previous study with more bright comparison stars, the 0.9-m telescope still had ample comparison stars and the internal photometric accuracy of the 0.9-m data proved to be superior to that of the Schmidt.

These comparison stars were used to perform differential photometry with respect to the variable on nights that were not photometric. Two of the six nights were photometric, and several Landolt (1992) standard star fields were observed on each night at a range of airmasses and times bracketing the RRL observations. These images were used to calibrate the differential photometry for this run and to recalibrate the photometry taken with the Schmidt.

REFERENCES

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