

PROBLEMS WITH THE BAADE WESSELINK METHOD

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Abstract. It is well known that the Baade-Wesselink method leads to different radii for Cepheids depending on which colors are used to determine the effective temperatures. We try to find the reasons for this discrepancy. We employ yet another version of this method using only maximum and minimum radii, thereby circumventing uncertainties in the phase relations between radial velocities and colors. This has essentially no influence on the derived radii. One major uncertainty is the relation between the photospheric expansion velocity and the measured radial velocity. The main reason for the discrepant results obtained by using different colors appears to be an inconsistency in the difference in the applied temperature-color calibrations. Small changes in the $d(\log T_{\text{eff}})/d(\text{color})$ can cause major changes in the derived radii.