A NEW TEMPERATURE SCALE FOR B STARS BASED ON OAO-2 DATA

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The empirical temperature scale of Code, Davis, Bless, and Hanbury Brown has been recalibrated in terms of an ultraviolet color derived from OAO-2 photometry, and mean temperatures have been computed for MK spectral types from O9 to A0. The dereddened color $(1910\text{-}V)_o$ was chosen as a temperature indicator because it is not strongly affected by lines or continuum edges. This parameter was computed for 16 stars with spectral types earlier than A2, luminosity classes III-V, and normal spectra, whose temperatures had been measured by Code et al. Plotting θ_{eff} against $(1910\text{-}V)_o$, we obtained the relation $\theta_{eff} = 0.111(1910\text{-}V)_o + 0.565$. Next, the quantity $(1910\text{-}V)_o$ was computed for over 150 stars in the same spectral-type range which had been observed by OAO-2, and a mean value was obtained for each spectral type. (Class III stars were excluded for types B5 and later because they were found to be systematically redder than classes IV and V - possibly an evolutionary effect.) Finally, the mean values of $(1910\text{-}V)_o$ were converted to effective temperatures using the formula given above. The resulting temperature scale is in good agreement with the scales of Morton and Adams, Schild, Peterson and Oke, and Code et al. for types B3 and later, but between types B0.5 and B2 the new scale and the Code scale are significantly hotter than the others. A particular application of the new calibration is the determination of small temperature changes occurring in early-type variable stars, since in this case the large and uncertain reddening correction drops out. For the β Cephei variables δ Cet and γ Peg, we obtained $\Delta T = 550^{\circ}K$ and $185^{\circ}K$, respectively. This work was supported by the National Aeronautics and Space Administration under grants NSG 5004 and NSG 5069.

Edith A. Müller (ed.), Highlights of Astronomy, Vol. 4, Part II, 339.