THE BLUE EDGE OF THE HELIUM STAR INSTABILITY STRIP

Yu. A. Fadeyev
Astronomical Council of the USSR Academy of Sciences

Abstract. Hydrodynamic calculations of nonlinear pulsations were done for models of helium stars with mass 1 $M_\odot$, luminosity from 3220 $L_\odot$ to 12820 $L_\odot$ and effective temperature from 6000K to 8000K. The models with $L > 8000L_\odot$ were found to pulsate in the fundamental mode with large amplitude ($\Delta R/R \sim 1$), whereas less luminous models ($L < 8000L_\odot$) revealed small amplitude oscillations ($\Delta R/R \sim 0.2$) in the first overtone. In the luminosity range considered the blue edge of the instability strip corresponds to an effective temperature of 7500K, that is to the upper limit of the effective temperatures of R CrB stars. Application of the period-luminosity relation to the variables R CrB and RY Sgr gives their luminosities to be of $9000L_\odot$.

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