SIMULTANEOUS IUE GROUND-BASED SPECTROSCOPIC OBSERVATIONS OF THE VARIABLE LMC STAR R 71

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ABSTRACT:

Using the IUE satellite we obtained high resolution UV spectrograms (1200 < λ < 3200 Å) of the S Dor type variable R 71 in the LMC. The IUE observations were supplemented by coordinated groundbased high dispersion spectroscopy and by photometric observations. From these observations we derive for the minimum state of R 71 the following stellar parameters: $L = 2.0 \times 10^5\ L_\odot$, $R \approx 81\ R_\odot$, $T_{eff} \approx 13\ 600$ K. For the expanding envelope we find a surprisingly low temperature of only about 6000 K and an apparently decelerated velocity field with a maximum outflow velocity of ~ 127 km s^{-1}. The minimum state mass loss rate is in the order of 3×10^{-7} $M_\odot\ y^{-1}$. Our results support the suggestion that the visual light variations of the S Dor type variables are produced by strong density variations of the expanding envelopes of these objects. A detailed study is forthcoming in Astronomy & Astrophysics.

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