

A New Lower Main Sequence Eclipsing Binary with Detached Components

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Abstract

We present an analysis of NGC2204-S892 – a new detached eclipsing binary composed of two late K dwarfs. Based on three photometric campaigns launched in 2008 we obtained 5 light curves (3 in V, 1 in B and 1 in I), and derived an orbital period of 0.451780 ± 0.000001 d. We also obtained 20 VLT/UVES spectra, enabling accurate radial velocity measurements. The derived masses and radii of the components ($m_1 = 0.733 \pm 0.005 M_{\odot}$ and $R_1 = 0.72 \pm 0.01 R_{\odot}$; $m_2 = 0.662 \pm 0.005 M_{\odot}$ and $R_2 = 0.68 \pm 0.02 R_{\odot}$) are consistent with the empirical mass-radius relationship established recently for lower main sequence stars in binary systems; in particular we find that both stars are oversized compared to theoretical models. NGC2204-S892 is very active: both components show variable emission in H α and H β and are heavily spotted, causing the light curve to show appreciable changes on a timescale of weeks. Our results add to the increasing evidence that the observed inflation of the radii of K and M stars is related to high levels of magnetic activity.

Key words: binaries: eclipsing – stars: individual: NGC2204-S892 – stars low-mass – stars: K-type