Low-frequency photospheric and wind variability in the early-B supergiant HD 2905

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Despite the important advances in space asteroseismology during the last decade, the early phases of evolution of stars with masses above $\sim$15 M$_{\odot}$ have been only vaguely explored up to now. Our goal is to detect, analyze and interpret variability in the early-B type supergiant HD 2905 using long-term, ground based, high resolution spectroscopy. We gather a total of 1141 high-resolution spectra covering some 2900 days. We complement these observations with the Hipparcos light curve, which includes 160 data points obtained during a time span of $\sim$1200 days. We investigate spectroscopic variability of up to 12 diagnostic lines by using the zero and first moments of the line profiles. We perform a frequency analysis of both the spectroscopic and photometric dataset. HD 2905 is a spectroscopic variable with peak-to-peak amplitudes in the zero and first moments of the photospheric lines of up to 15\% and 30 \kms, respectively. The amplitude of the line-profile variability is correlated with the line formation depth in the photosphere and wind. All investigated lines present complex temporal behavior indicative of multi-periodic variability with timescales of a few days to several weeks. The Scargle periodograms of the Hipparcos light curve and the first moment of purely photospheric lines reveal a low-frequency amplitude excess and a clear dominant frequency at $\sim$0.37 d^{-1}. In the spectroscopy, several additional frequencies are present in the range 0.1 - 0.4 d^{-1}. These may be associated with heat-driven gravity modes, convectively-driven gravity
waves, or sub-surface convective motions. Additional frequencies are detected below 0.1 d^{-1}. In the particular case of Hα, these are produced by rotational modulation of a non-spherically symmetric stellar wind.

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