

Ongoing brightening of the eclipsing symbiotic star AR Pav

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AR Pav is an eclipsing symbiotic star with an orbital period of around 605 days (e.g., Sekeráš et al., 2019, CAOSP, 49, 19, and references therein). Its photometric activity has been monitored since 1889 (see Fig. 1 in Skopal et al., 2001, IBVS, 5195 and Fig. 23 in Sekeráš et al., 2019, CAOSP, 49, 19). Its long-term photographic/B-band light curve is characterized by ~ 2 mag eclipses and an out-of-eclipse variability between 10 – 12 mag. Several brightenings of the system have been detected in past, with the most prominent outbursts observed in 1900 and 1935, when the star reached ~ 9 mag. In the recent decade, the star experienced only smaller brightenings in 2013 and 2014 during which the star was always fainter than 10.5 mag.

The [photometric observations of AR Pav by the ASAS-SN survey](#) (Shappee et al., 2014, ApJ 788, 48; Kochanek et al., 2017, PASP, 129, 104502) revealed an ongoing brightening by about 1.2 mag (with a peak brightness around 10 mag in the g filter). A slight rise towards the maximum started in April 2021 and accelerated in May 2021, reaching the maximal brightness at the beginning of June. Since then, according to the [recent ASAS-SN light curve](#) of AR Pav, brightness seems to fluctuate in a pattern similar to superhumps observed in cataclysmic variables (although some additional unexplained scatter seems to be present in the light curve). Such behavior is not detected during the rise to the maximum nor during the previous orbital cycles observed by ASAS-SN.

We obtained [an optical spectrum of AR Pav](#) on August 9, 2021 (JD 2 459 435.7) using an Alpy600 spectrograph mounted at a remotely controlled 35-cm Ritchey-Chretien telescope located in Chile. The spectrum shows a weak continuum of an M giant in addition to strong emission lines of H I, He I, [O III], relatively faint He II, and several emission lines of Fe II. Emission lines with a higher ionization potential (e.g., [Fe VII]) are not detected in our spectrum. The overall appearance of the spectrum is consistent with a Z And-type symbiotic star in an outburst.

Further multi-band photometric and spectroscopic observations are encouraged.

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