Wolf-Rayet Stars
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P Cygni and its Observations at the Abastumani Observatory

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We found original observations of P Cygni by E. Kharadze and N. Magalashvili in the archives of the Abastumani Observatory. These observations were carried out in the period 1951–1983. Initially they used 29 Cygni as a comparison star, and all observations of P Cygni were processed using this star. On the basis of their calculations, the authors decided that P Cygni may be a W UMa type binary with an orbital period of 0.500565 d, but this hypothesis was not confirmed. The only observations that have been published in the Bulletin of the Abastumani Astrophysical Observatory were those of of 1951–1955. There are whole sets of observational data not only for P Cygni and 29 Cygni, but in the majority of cases also for 36 Cygni in the archives. We recalculated all data (where it was possible) using 36 Cygni as a comparison star. We are presenting UBV light curves of the variable, and also observations made by V. Nikonov in Abastumani in the period 1935–1937.

UBV Observations at the Abastumani Observatory

Investigations of variable stars were performed in the Abastumani Observatory from the very beginning of its establishment (1932). Photoelectric observations of P Cyg were made using the 33 cm reflector during the period 1935–1937 comprising 758 days in total. We emphasize that the increase in brightness for P Cygni was almost 0.3 mag between 1935–1936 (Nikonov 1937).

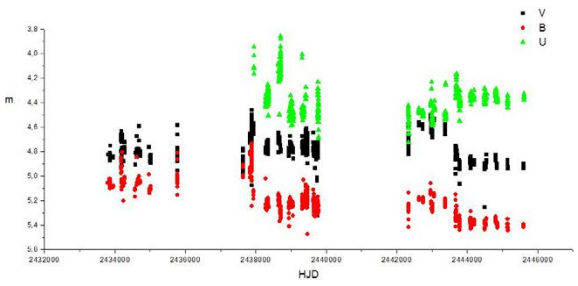

Fig. 1: UBV observations of P Cygni made by E. Kharadze and N. Magalashvili during 1951–1983. 36 Cygni = HD 193369 was used as comparison star.

From 1951 N. Magalashvili and E. Kharadze were regularly observing P Cyg using the 33 cm reflector with an electro-photometer. On the basis of these observations, they concluded that the behavior of the star was similar to W UMa variability, with a period of 0.500565 d and an amplitude of 0.10–0.08 mag (Magalashvili & Kharadze 1967). But W UMa type variability was not confirmed. Presumably, one of the reasons of Magalashvili–Kharadze erroneous conclusions is the complex variability of the star; it is possible that the variability of 12–14 hours does really exist. The latest revision of the observational material fortunately allowed us to re-process the 1951–1967 and 1974–1983 observations and to estimate the true variability picture of P Cygni. After 1968, E. Kharadze and N. Magalashvili used the same filters and the same photometer with the 48 cm Cassegrain telescope. These observations are unpublished, so we recalculated the data using 36 Cyg as comparison star (where it was possible). The UBV data are presented in Fig. 1.

At the first glance, we can see that during 1974–1983 the star dimmed in the U band while it brightened in the B and V bands (the last third part of Fig. 1). The middle part of the figure represents the time interval 1961–1967. Here the colour behavior of the star is different: during brightening in the V band, the star becomes fainter in B and U.

Conclusions

We think that the unpublished observations of P Cygni obtained by E. Kharadze and N. Magalashvili at the Abastumani Observatory are very significant for the following reasons: *1.* they are homogenous observations spanning more than 30 years, which could reveal periodicities in brightness variations; *2.* from the UBV observations it is possible to trace the colour behavior of the star; *3.* the observations by Nikonov, Kharadze and Magalashvili are unique because they are the only existing data of P Cygni observed with UBV filters between 1935 and 1983.

References

Magalashvili, N. L. & Kharadze, E. K. 1967, Information Bulletin on Variable Stars, 210, 1
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