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SPECTROSCOPIC OBSERVATIONS OF PU Vul

The peculiar nova-like variable PU Vul was observed on July 3,5,9,1984 using the grating spectrograph at the Nasmyth focus of the 60/90-cm Schmidt telescope of Beijing Observatory. The emulsion used was Kodak 103aF. The spectral range was 3500-6700Å. The reciprocal dispersion was 167Å/mm. The spectral features were almost the same as those on December 11,1983 (Liu Zongli, Hao Xiangliang, IBVS, No.2466, 1984). The main absorption lines were H_γ-H₁₀, Ca II H,K, Fe II and Ti II. The H_β was filled with emission. The H_α emission was quite strong still.

Since 1982 the H_α emission has remained for two years. Since 1981 PU Vul has been always at maximum light according to Kolotilov et al. (IBVS, No. 2097, 1982), Purgathofer et al. (IBVS, No.2291, 1983) and our photographic observations.

Besides our observations, we have reviewed the overall behaviour of this object. All phenomena observed for this star led us to suggest that this object should be an exceptionally slow nova. And it may be a binary which consists of an M giant and a hot component. Due to the mass exchange and accretion of the hot component the temperature of the hot component increased. Many mini-eruptions happened and a great deal of material was ejected. Thus there is a lot of circumstellar matter around the hot component. This matter produces a large amount of extinction at the short wavelength and changes its distribution of radiation. So this binary shows the spectral type of the M giant in general. And it shows the spectral type of the A or F giant only during the maximum light. This model might explain most of the observational results, such as the spectral type of M4 on August 30, 1958 (C.B. Stephenson, IAUC, No.3356, 1979), the spectral type of M4 on September 6.59, 1978 (K. Ishida, IAUC, No.3350, 1979), the spectral type A or F during the maxima of 1979 (Gershberg R.E. et al., Soviet Astron. J., 1982, 59, No 1, 6-14) and 1981-1984, and the spectral type of M at the

phase of the rapid decrease of brightness and at the minimum in 1980 (Gershberg R.E. et al., Soviet Astron. J., 1982, 59, No 1, 6-14). The circumstellar matter makes the Balmer decrement so large that only the H_{α} emission could be seen in general. The H γ emission could only sometimes be seen. The diluted radiation from a hot star is sufficient to excite the $D_{1,2}$ emissions, Balmer emissions and the nebular lines of [N II] and [O III]. The orbital inclination of PU Vul may possibly be small, so no indication of orbital motion could be seen.

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