COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 2097

Konkoly Observatory
Budapest
1982 March 3

HU ISSN 0374-0676

THE OPTICAL VARIABILITY OF PU VULPECULAE (KUWANO'S OBJECT) IN 1979 - 1981

The variable star PU Vul has been discovered in 1979 by Y. Kuwano (1) and M. Honda (2). The star made a gradual flaring up of five magnitudes for 1977-1979 (3). Photoelectric UBV photometry has been carried out in Crimea during 1979-1981. The observations were made with the use of the 64 cm telescope of the Crimean Astrophysical Observatory and the 60 cm reflector of the Crimean station of Sternberg Astronomical Institute. These observations were partly published in (4). Figure 1 shows the composite light curve in V and the colour curves in B-V and U-B, where the Crimean measurements and the photoelectric observations of other authors (5-12) are presented by dots and crosses, correspondingly .

As seen from Figure 1, during 1979 the brightness of PU Vul changed around $\bar{V} \approx 8^{m}.9$, the half amplitude was $\Delta V \approx \pm\ 0^{m}.15$. Dr. D. Chochol from Skalnate Pleso Observatory (Czechoslovakia) determined (private communication) the following elements from the photometry in 1979: Min. J.D. 244 $4173^{d}.38 + 76^{d}.4$. The variations of colour index B-V corresponding to periodic V light change are obvious, but for U-B such conclusion is impossible. Besides, in 1979 both colour indices slowly increased from $\sim +0^{m}.40$ to $\sim +0^{m}.70$ in B-V and from $\sim +0^{m}.20$ to $\sim +0^{m}.50$ in U-B.

The rapid decrease of brightness of PU Vul started in February, 1980. During the phase of full decline between J.D. 244 4290 - ...4480 the amplitude ΔV was estimated as equal to $\sim +4^{m}.8$ with the rate $\Delta V/\Delta t \approx +0^{m}.025$ per day (this decline rate was obtained in (11) on the initial part of fading). Meanwhile noticeable colour indices variations also occurred. Before

the end of the declining phase in V they achieved the maximum values B-V $\simeq +1^{m}.0$ and U-B $\approx +0^{m}.80$ in time interval J.D. 244 4340-...4360 and then both B-V and U-B decreased.

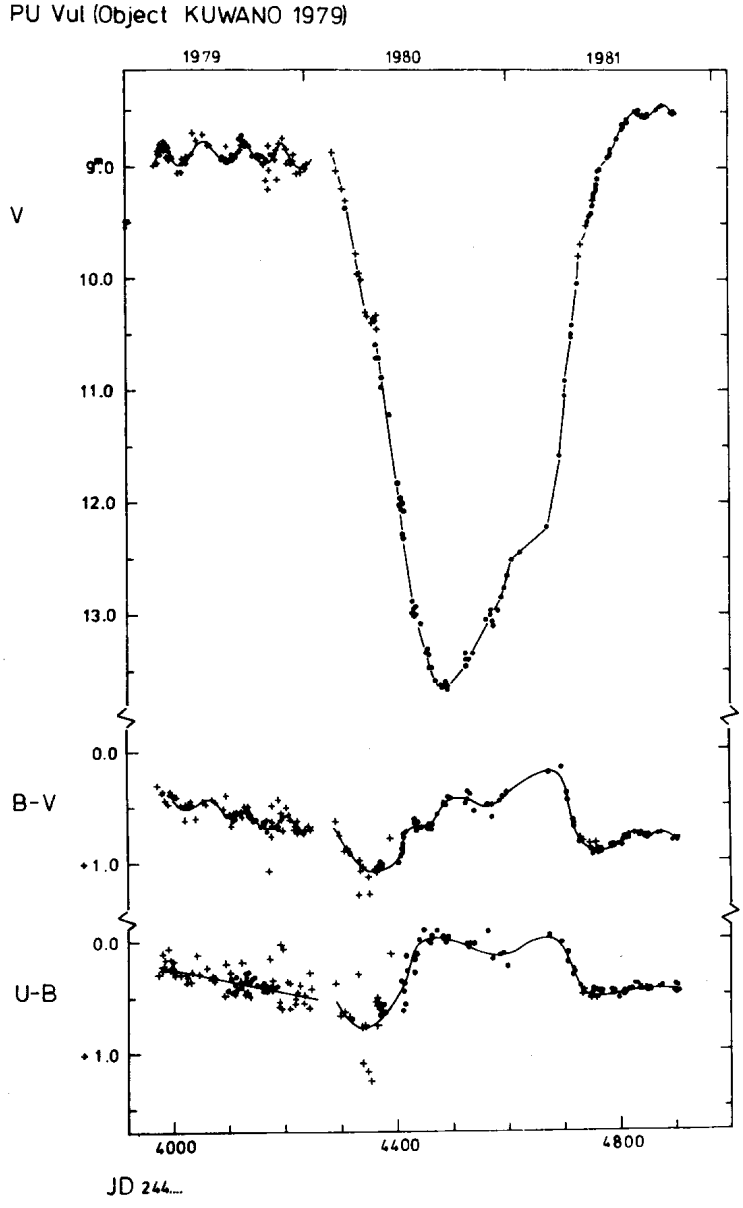

Figure 1

From our observations PU Vul had a light minimum ($V \approx 13^m.65$) in the time interval J.D. 244 4480 -...4490. In this time, B-V and U-B decreased to ~ $+0^m.45$ and ~ $0^m.0$, respectively. The next brightening of PU Vul had two stages. At first, in the time interval J.D. 244 4490 -...4670 it was characterized by the brightening at a rate $\Delta V/\Delta t \approx -0^m.008$ per day on average. By the end of this stage colour index B-V decreased downward ~ $+0^m.20$. The variations of U-B occurred symmetrically in this time interval (see Figure 1).

Further, in the time interval J.D. 244 4670 -...4830 the brightening of PU Vul was characterized by noticeably greater rate, $\Delta V/\Delta t \approx -0^m.023$ per day. This value is similar to that of the light decrease to the minimum. With the beginning of this stage the colour indices increase rapidly as B-V $\approx +0^m.92$ and U-B $\approx +0^m.50$ around J.D. 244 4760. After this moment U-B slightly changed on average, but B-V decreased to ~ $+0^m.76$ at J.D. 244 4830. By this time the systematic light increase of PU Vul had been finished and its brightness equalled on average $\bar{V} \approx 8^m.5$. Thus the star was brighter than during its maximum of 1979. The time span of light decrease of PU Vul was about 500 days. Note also that our observations from J.D. 244 4830 permit us to suspect the existence of periodic light variations of the star with shorter period and smaller amplitude than in 1979.

The results of the detailed analysis of the photometric observations of PU Vul carried out in 1979-1981 will be published elsewhere.

E.A. KOLOTILOV
Crimean Station of Sternberg Astronomical Institute, 334413, p/o Nauchny, Crimea, USSR

T.S. BELYAKINA
Crimean Astrophysical Observatory, 334413, p/o Nauchny, Crimea, USSR

References:

(1) Y. Kuwano, IAU Circ. No. 3344, 1979.
(2) M. Honda, IAU Circ. No. 3348, 1979.
(3) M. Honda, K. Ishida, T. Noguchi, Y. Norimoto, N. Nakagiri, T. Soyano, Y. Yamashita, Tokyo Astron.Bull. No. 262, 2983, 1979.
(4) T.S. Belyakina, Yu.S. Efimov, E.P. Pavlenko, V.I. Shenavrin, Soviet Astron. Journal, 59, No. 1, 1982.
(5) C.A. Whitney, IAU Circ. No. 3348, 1979.
(6) R.E. Zissel, IAU Circ. No. 3355, 1979.
(7) S.S. Mims, T.L. Mullikin, IAU Circ. No. 3380, 1979.
(8) T.E. Margrave, IAU Circ. No. 3421, 1979.
(9) H.S. Mahra, S.C. Joshi, J.B. Srivastava, S.L. Dhir, IBVS No. 1683, 1979.
(10) A. Bruch, IBVS No. 1805, 1980.
(11) M. Nakagiri, Y. Yamashita, Tokyo Astron.Bull. No. 263, 2993, 1980.
(12) A. Purgathofer, A. Schnell, IAU Circ. No. 3604 and No. 3610,1981.