

# OUTBURST CYCLICITY OF DWARF NOVA VZ AQUARI

L. I. Shakun

Astrophysical Observatory, Moldova State University  
str. Mateevich 60, 277014, Kishinev, Moldova

**ABSTRACT.** New linear elements for outbursts of VZ Aqr from 1904 to 1987 were obtained with  $P_0 = 50.4053^d$ . Two states of outburst activity are distinguished with cycle lengths  $47.128^d$  and  $55.041^d$ , replacing each other during  $\Pi = 13.2\text{yr}$  and accompanied by a maximum brightness changes. Instability parameters of VZ Aqr -  $\lg P$ ,  $\lg P/P_0$ ,  $\lg \Pi$  and  $\lg N_0$  agree well with a dependence of these parameters on  $\lg P_0$  derived by the author for other dwarf Novae.

**Key words:** Stars: Dwarf Novae, Binaries

VZ Aqr, belonging to a Dwarf novae UGSS subtype, was observed in the Astrophysical Observatory of the Moldova State University from JD 2445229 to 46695. At the telescope AZT-3 we have obtained 103 photographic observations.

There were used 49 moments of outbursts, which were determined from the original observations and from literature. The linear elements were determined by using these moments:

$$\text{Max JD} = 2441543.856 + 50.4053 \cdot E_0 \\ \pm 5.244 \quad \pm .0411$$

They describe the stellar behaviour during the period 1904 - 1987 yrs. Dependence ( $O - C$ ) on JD shows that VZ Aqr has two alternating periods of outburst appearance replacing each other. The same outburst cycling resembles the stars of this class which were earlier described by Bianchini (1988) and by Shakun (1987a, 1988). As in the case of UU Aql (Shakun, 1987b), in the behaviour of light at the outburst maximum some peculiarities were observed. Weak outbursts take place in the region of extreme significance ( $O - C$ )<sub>0</sub>.

For linear sections with a sufficient number of observations the corresponding linear elements were calculated, describing the outburst behaviour:

$$\text{Max JD} = 2426169.914 + 47.2691 \cdot E_1 \\ \pm 6.795 \quad \pm .4613$$

$$\text{Max JD} = 2440562.293 + 54.7552 \cdot E_8 \\ \pm 5.429 \quad \pm .4451$$

$$\text{Max JD} = 2444056.615 + 46.9844 \cdot E_9 \\ \pm 5.109 \quad \pm .3807$$

$$\text{Max JD} = 2445516.991 + 55.3258 \cdot E_{10} \\ \pm 4.873 \quad \pm .5520$$

Thus we draw the conclusion that the star has two states of activity with an average periods of 47.128 and 55.041 days appearing outbursts, changing each other with a  $\Pi = 4800^d$  cycle.

The star average light at the maximum of the outburst in the first case is equal to  $13.3^m$ , in the second case - to  $12.8^m$ . This means that when the frequency of the outbursts is larger, than they are weaker, as for example, in the case of UU Aql.

The calculated nonstability parameters of the outburst activity of VZ Aqr sufficiently join the earlier determined Shakun's (1989) dependence of the same parameters on  $\lg P_0$  for other Dwarf novae.

## References

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