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ON THE PERIODS OF RZ COMAE AND V1073 CYGNI

After a long stretch of time characterized by virtually constant periods, these two systems show sign of recently occurring period changes. We would like to note here these variations in order

to determine new (linear) ephemeris formulae for the near future and

to recommend these interesting systems to photoelectric observers for follow-up observations.

A more detailed study of the periods of these binaries together with a discussion of some 30 further W UMa systems is presently being prepared by one of us. The period changes mentioned here have been first noticed during runs of observation at Kitt Peak National Observatory in 1979 and 1980. The systems were later reobserved at Ankara Observatory in order to define the current photometric ephemeris.

We would like to point out that in spite of the apparent similarity of the period changes, the two systems are, within the class of W UMa binaries, rather far apart: V1073 Cygni is a Type A system with one of the longest periods known (0.79 days) while RZ Comae is a Type W system with the somewhat short period of 0.34 days.

RZ Comae. This is a rather neglected system with photoelectric observations covering only the time span of 1950-58; the main study is Broglia's (1960) showing a constant period P = 0.33850604d. Photographic and visual minimum epochs suggest that the same period might have prevailed from about 1934 to 1966. A set of 8 AAVSO timings from 1969 (Baldwin 1973) shows predominantly negative residuals, $O-C=0^d.005 \pm 0^d.0016$, perhaps already indicating a small change in the period.

The Kitt Peak observations from 1979 indicated that Broglia's ephemeris predicted minimum times about 8.6 minutes later than observed. The Ankara measurements, undertaken to derive the new period, confirmed the variation but yielded, rather unexpectedly, practically the same residuals as the Kitt Peak observations two years earlier. Taking these data at face value, that is assuming a timing accuracy of ±0.0001 to ±0.0002 days, would indicate that Broglia's period is still valid but the zero epoch has to be shifted by -0.006d. This seems a rare, almost unique occurrence which makes the observation of the system very desirable.

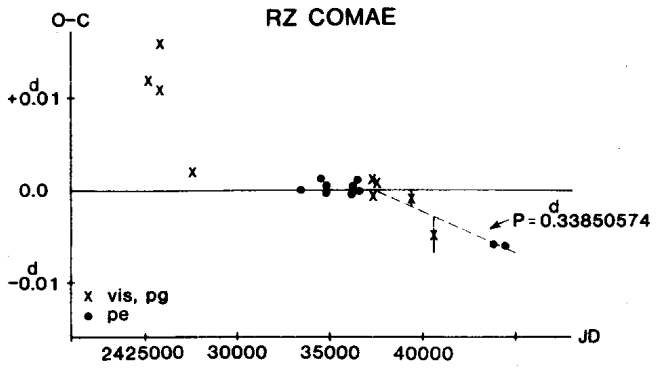

Figure 1

Timing residuals for RZ Comae. (Ephemeris: Broglia 1960.)

Earlier visual and the recent photoelectric observations are, on the other hand, not inconsistent with a small change in the period (see Fig. 1) of about 3×10^{-7} days; this would produce a difference of 0.0006 days between the Kitt Peak and Ankara residuals. The two year baseline separating these observations is probably too short for a definitive statement. We tentatively suggest the new ephemeris formula (Kitt Peak epoch + Broglia's period)

Min.I = JD2443967.9371 + $0^d.33850604E$, with the proviso that it may give residuals of the order of -0.0012 days for Spring 1984.

The following Table gives the four new epochs of minimum.

Min. (JD hel)	O-C (Broglia)	Observatory
2443964.8906	$-0^d.0061$	Kitt Peak, no. 3 14-in.
43967.9372	-0.0060	-
44694.3712	-0.0060	Ankara Obs. 12-in. pe
44695.3868	-0.0059	-

V1073 Cygni This system can hardly termed neglected: there are 25 photoelectric epochs of minimum since 1962 but their distribution with time (see Fig. 2) is

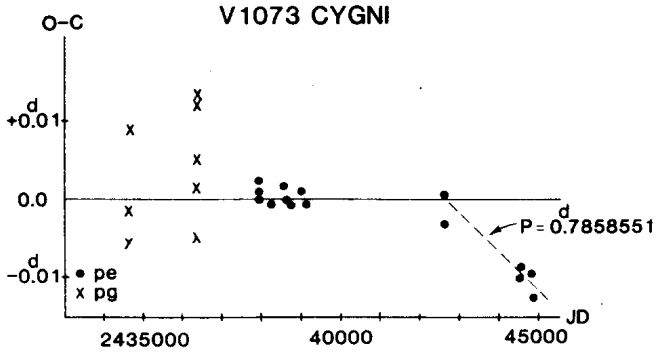

Figure 2
Timing residuals for V1073 Cygni. (Ephemeris: Kondo 1966.)

somewhat uneven. The first comprehensive discussion of the system was given by Kondo (1966); further photoelectric observations were secured at Leiden, Bologna, Catania and Bucharest. Observations between 1953 and 1975 indicate the constancy of the period (Kondo's value: P = 0.7858597d); earlier photographic observations, in spite of their very large scatter, suggest that the same period might be traced as far back as 1930. This means at least 45 years of constant period yet the new data (Kitt Peak 1980, Ankara 1981) indicate that a period change amounting to about -0.4 sec occurred, perhaps around 1976.

We propose the following ephemeris for current use:

Min.I = JD2444502.8652 + $0^d.7858551$ E.

The new epochs are separated by less than one year and show a larger scatter, thus the uncertainty of the new period may be an estimated $\pm$ 4 x 10^{-6} days. Nevertheless, the new formula will allow much improved predictions of the minimum epochs for the near future.

Min (JD hel)	O-C (Kondo)	(O-C) current	Observatory
2444501.8648	$-0^d.0099$	$-0^d.0004$	Kitt Peak, no. 4 16-in.
44506.7950	-0.0090	+0.0005	-
44783.4139	-0.0127	-0.0016	Ankara, 12-in. pe
44790.4489	-0.0095	+0.0017	-

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