

3C 345: THE PERIODS IN THE OPTICAL VARIABILITY AND FURTHER CONFIRMATION OF A CONNECTION BETWEEN OPTICAL OUTBURSTS AND SUPERLUMINAL COMPONENTS OF RADIOJET

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We present new results of our monitoring program for the superluminal quasar 3C 345 having been in continuous operation since 1968. The photographic B-band observations newly reported were made in 1984-91 during 218 nights. The optical light curve (1965-91) containing all available B-band observations was obtained.

It was supposed earlier (Babadzhanyants and Belokon, 1985) that in 60-70s the appearance of the superluminal jet components of 3C 345 are connected with the large amplitude optical outbursts. Now we analyze the structure of the light variations in 80s for comparison with the new VLBI observations.

The Fourier analysis was performed using only 1979-90 data set. It supposes 695-day period with confidence. The mean light curve obtained by means of the phase diagram for the 695-day period using all 1979-90 observations (N=506) represents the outburst having two-peaked main maximum and secondary one. This mean curve turned out quite identical both in form and duration to the 1967-68 outburst having been observed by Kinman et al. (1968) in detail.

Moreover, the power spectrum obtained for united (1965-69 + 1979-90) time intervals containing nearly equal number of data points supposes practically the same period (702-days), mean light curve remaining the same as earlier. We mark that determined periodic component corresponds completely to 800-days harmonic revealed by Barbieri et al. (1977) who had analyzed 3C 345 light curve up to 1976 only. Besides, a new large optical outburst beginning in 1991 shows much more reality of nearly 5-years period suspected by number of authors repeatedly.

The "birth-times" of the new superluminal components C4, C5, C6 (T.Krichbaum, private communication) and C6' by Tang et al. (1989) observed in 80s coincide with the beginnings of revealed periodical outbursts quite similarly as for the events in 60-70s reported earlier.

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