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THE PULSATOR 21 COM

Short-time variations in the light flux of 21 Com ($V = 5.46$, $Sp = A2p$) with periods ranging from 30 to 39 min have recently been reported by many authors (see Weiss, 1983 and references therein). Musielok and Kozar (1982) found variations with periods around 6 min and no evidence of other periodicities. However the accuracy of their determination was questioned by Kurtz (1983) on the basis of an insufficient time resolution of their data. Periods of 6 and 24 min were subsequently reported by Garrido and Sanchez-Lavega (1983). The most recent information on the power spectrum of 21 Com was presented by Weiss (1983). He was unable to detect any variability with periods ranging from 6 to 30 min.

The need to clarify these discrepancies on the photometric variation periods of 21 Com has led us to carry out high-speed photometric observations of this star. The observations were carried out during 5 nights in the period February - April, 1987 using the cooled twin-beam photoelectric photometer "URSULA", (see De Biase et.al., 1988, for a complete description of the instrument) fed by the 91 cm Cassegrain telescope of Catania Astrophysical Observatory. We adopted an integration time of 20 sec, so that a total of 2598 data points,

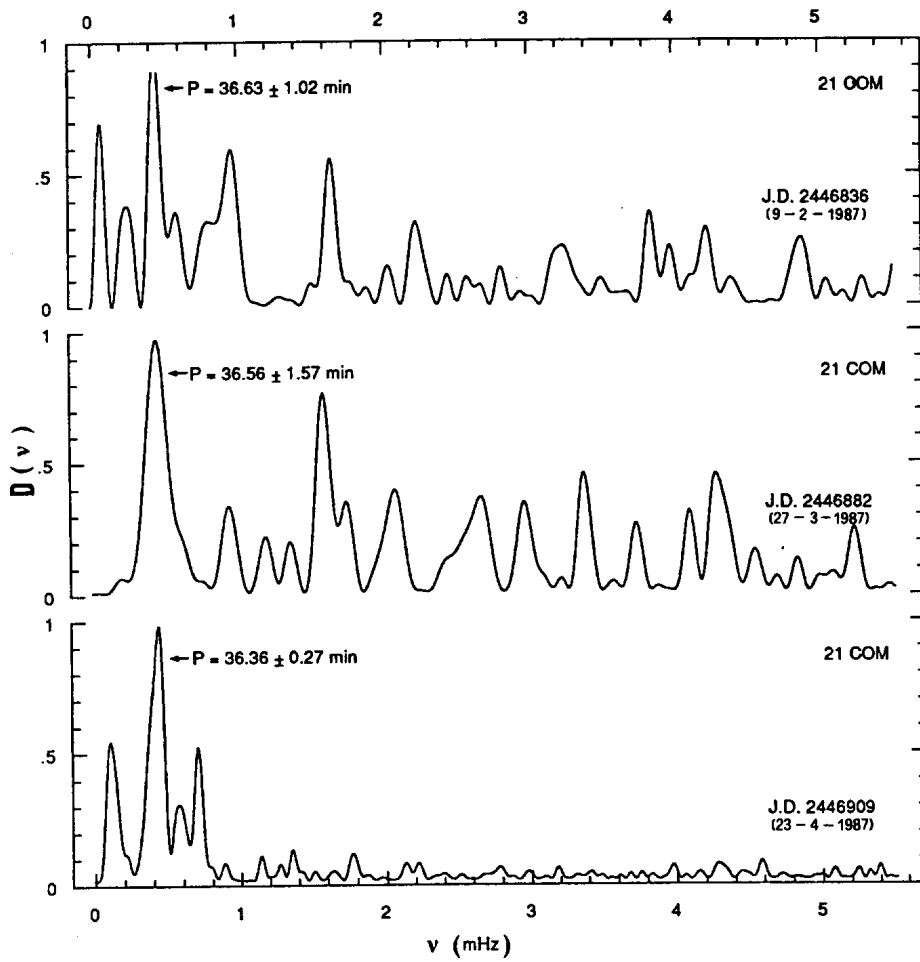


Figure 1 - Normalized power spectra derived from the data on each observation night. The spectra of the individual nights show a peak at a frequency close to 0.46 mHz (36 min).

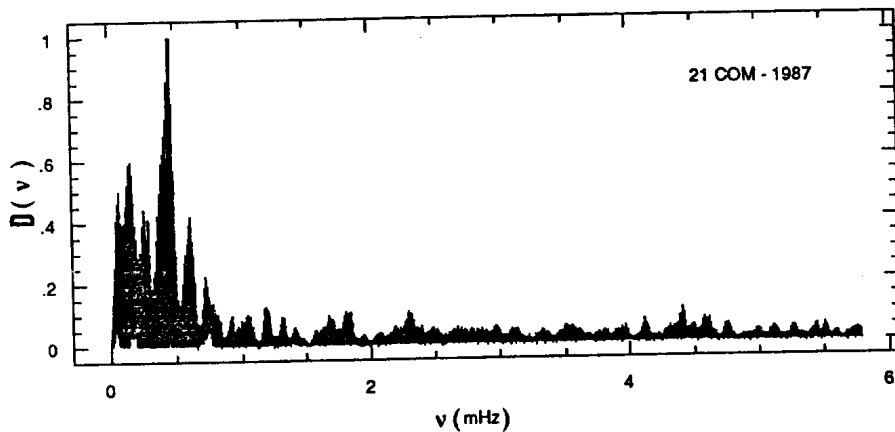


Figure 2 - Normalized power spectrum of all data sets obtained at Catania Observatory in the period February-April, 1987. The dominant frequency is 0.46 mHz (36.08 ± 0.05 min). At 3 mHz no significant power is apparent.

covering about 16 hours of observation, were collected. A neutral filter was used in order to reduce the flux coming from the bright star.

We performed a frequency analysis for each night, using the technique of Fourier transform for unequally spaced data (Deeming, 1975). Some of the normalized power spectra obtained for three different nights are shown in Fig.1. The dominant periods are close to 36 minutes and coincide, within the errors, for all the nights.

As a next step in the frequency analysis of 21 Com data, we processed together all the data sets. In Fig.2 the power

spectrum in the range from 0 to 0.58 mHz is shown; it exhibits a significant peak at frequency 0.46 mHz (36.08 ± 0.05 min), which corresponds, within the errors, to the values derived from each single observation night. Moreover, the power spectra shown in Fig.1 and in Fig.2 indicate that no significant frequency appears at 3 mHz; this result is not in agreement with the conclusions of Musielok and Kozar (1982) and Garrido and Sanchez-Lavega (1983) and suggests that 21 Com is not a rapidly oscillating Ap star.

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