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ON THE VARIABILITY OF CENTRAL STARS OF
TWO PLANETARY NEBULAE

There are several indications on the existence of rapid small-scale oscillations of the central stars of planetary nebulae (see Kohoutek, 1966; Lawrence et al., 1967; Stothers, 1977). Amplitudes of oscillations lie in the range of thousandths and hundredths of stellar magnitude on time scale extending from minutes to several weeks. Photoelectric observations of two planetary nebulae (NGC 7009, $m_{pg}=8.5$ and NGC 7662 $m_{pg}=9.0$) were carried out during three nights in September, 1979 in order to detect and study their microvariability. The nebula diameters are less than one minute of arc. Observations were made at the Abastumani Astrophysical Observatory on the 48-cm telescope with 50" diaphragm by the photon counting method. Integrations of 10sec in B filter were used. In order to control the atmospheric properties of the night the normal star HD 21479 ($A_2V, m_v=7.28$) was observed after the nebulae. The data are given in Table I.

Table I

Object	Date	Number of observations	Mean-square amplitude (mag.)
NGC 7009	14 - 15.9.1979	740	0.0048
NGC 7662	20 - 21.9.1979	916	0.0046
	21 - 22.9.1979	896	0.0036
HD 21479	21 - 22.9.1979	95	0.0024

Figs. 1 and 2 show the autocorrelation functions (ACF) and the power-spectra of brightness variations. The results are the following:

1) Both nebulae display the microvariability with amplitudes of 0.002-0.003 mag and periods 82 min (NGC 7009) and

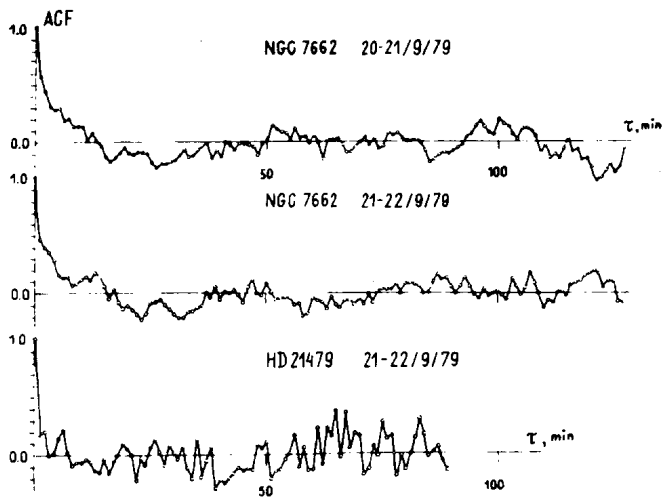


Fig. 1.

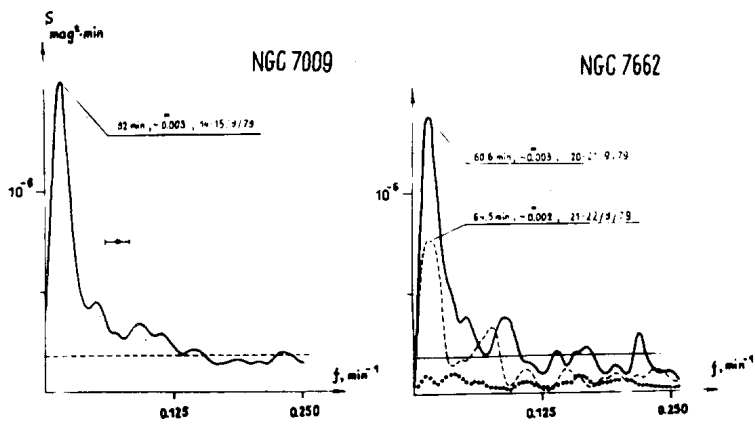


Fig. 2.

60-64 min (NGC 7662);

2) The frequency spectrum shows no significant variations from night to night, amplitudes in this case may change noticeably (Fig. 2, NGC 7662).

3) Comparison of ACF and power-spectra of NGC 7662 with those of the control star in the same night (in Fig.2 depicted by circles) testifies to the physical variability of the nebulae in brightness rather than variability due to fluctuations in atmospheric transmission.

The authors suppose that the microvariability of the planetary nebulae indicate on the activity of their hot central stars, concentrated in the UV region.

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