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V. I. Pronik, I. I. Pronik, and K. K. Chuvaev.
Distribution of the Energy in the Spectrum of the P
Pulsar of the Crab Nebula.

In February–March of this year, an attempt was made at the Crimean Astrophysical Observatory of the USSR Academy of Sciences to obtain the distribution of the energy in the spectrum of the pulsar NP0532 in the optical range. The observational material constitute the ordinary photographs of the Crab Nebula, obtained with the ZTSh telescope with different filters having λ_{eff} from 3600 to 7400 Å, and exposures from several seconds to several minutes. From the photographs obtained in February, we estimated the brightness of the pulsar at different wavelengths relative to the brightness of the nearest northern star (spectral class G), and found that besides the ultraviolet excess in the spectrum of the pulsar, there is apparently an excess of radiation also in the near infrared region. At the beginning of March, using the ZTSh telescope, photographs of the pulsar, of very good quality, were again obtained. In order to eliminate the influence of the gas flocculi projecting from the pulsar, the photographs taken with filters that transmit the emission lines of the flocculi were not processed. The brightness of the pulsar in each filter was determined relative to the brightness of the adjacent background of the nebula, the spectrum of which was assumed to be equal to the spectrum of the nebula as a whole. The latter was constructed from the observation data of various authors (\circ —^[1], \square —^[2], \bullet —^[3]), and is shown in Fig. 1. Observations in the infrared region of the spectrum are presented only to verify that the break of the spectrum, near λ 5500 Å, actually exists. Figure 2 the spectrum of the pulsar (2): the light circles represent our measurements of the pulsar with different filters relative to the nebula, pertaining to the summary effect from both pulses; the dark circles are the measurements of Oke^[4], pertaining to the principal pulse. For comparison, the same figure shows the integral spectrum of the Crab Nebula (1) and the spectrum of the background of the nebula under the pulsar, measured by Oke at the instants between the pulses (3). The deviation of the designated points on curve 3 gives an idea of the intensities of the lines in the spectrum of the gas flocculi projecting from the pulsar. The zero point of the vertical scale differs for the different curves. The good

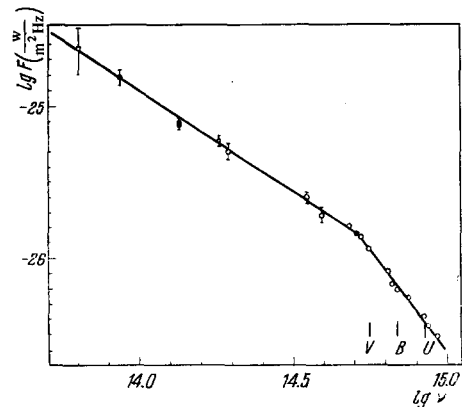


FIG. 1. $\alpha = -1.3$ for the upper left part of the curve, and $\alpha = -2.8$ for the lower right.

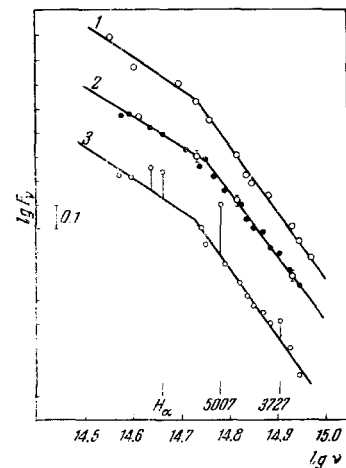


FIG. 2

agreement between our results and the results of Oke confirms the correctness of the assumption made above, namely that the spectrum of the background from the nebula near the pulsar is the same as the spectrum of the Crab Nebula as a whole. It is clearly seen in Fig. 2 that the spectrum of the pulsar in the optical band is identical to the spectrum of the Crab Nebula, with the only possible slight difference that the spectrum of the pulsar is shifted relative to the spectrum of the nebula towards higher frequencies by an amount $\Delta \log \nu \sim 0.025$.

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Yu. I. Alekseev, V. V. Vitkevich, and Yu. P. Shitov,
Fine Structure of the Pulses of the Pulsar CP0808 and
Variation of the Periods of the Second Class

The paper reports a discovery, made at the Radio Astronomical Station of FIAN, that the pulsar CP0808 has periodic pulsations of the second class, with a