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DETERMINATION OF THE MAGNETIC FIELD IN THE STAR V 474 Mon

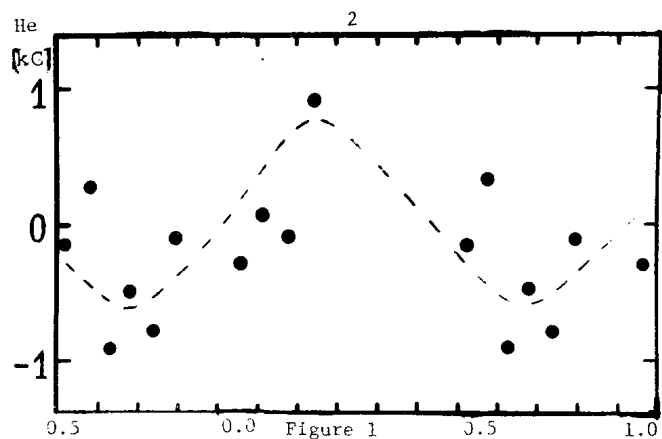
V 474 Mon (HD 40535) is a variable star of Delta Scuti type with the primary period of light variation $P=0^d.1361260$ showing the Blazhko-effect with $\Pi = 7^d.746+0^d.001$ (Romanov, Fedotov, 1979). Both the primary period and the Blazhko-effect period are exhibiting stability according to published observations. An abnormally great variation of light amplitude is present with the Blazhko-effect period; from $0^m.04$ to $0^m.36$ (Millis, 1973).

Spectral observations of this star were carried out with the second camera of the main stellar spectrograph of the 6-m telescope, SAO, Academy of Sciences, USSR, in September, 1982. Spectrograms of the stars α^2 CVn and β CrB were also obtained from 1980 to 1982. These magnetic stars have been investigated more completely and have been used as standards of magnetic field.

An achromatic analyzer of circular polarization with a Fresnel rhomb has been used as a phaseshifting element along with a crystal of Iceland spar which provide the 5" separation of circularly polarized light beams at the spectrograph slit (Glagolevsky et al., 1978). All the spectrograms were obtained with an inverse linear dispersion of $9 \text{ \AA}/\text{mm}$. Time resolution used was 4-7 minutes for V 474 Mon and 1-3 minutes for α^2 CVn and β CrB. Kodak emulsion 103a0 hypersensitized with hydrogen according to the procedure developed at the Odessa Astronomical Observatory has been used. The spectral interval of wavelength is 3900-5000 \AA .

From 20 to 70 lines have been measured in each spectrogram in the spectral range 4000-4600 \AA . Probable error of one measurement amounts to 130-280 gauss for V 474 Mon, 300-550 gauss for α^2 CVn and 100-300 gauss for β CrB. The determinations of magnetic field strength for α^2 CVn and β CrB agree with those of other authors in all phases.

Variation of the magnetic field strength for V 474 Mon are given in Fig 1. Phases of the fundamental pulsation period were calculated according to the ephemeris: Max hel. J.D. = $2441661.1668 + 0^d.13612600 \cdot E$ and phases of the Blazhko-effect in the star according to : J.D. max (O-C) = $2441664.962 + 7^d.74639 \cdot N$ (Romanov, Fedotov, 1979). These elements are in a good agreement with all known observations.



It is seen from Fig.1 that the magnetic field strength changes with the phase of stellar pulsation. The large scatter of points results from both errors of measurements and the Blazhko-effect process. The character of this variation is not yet found. It should be noted that not only the magnetic field strength changes, but also the field sign changes.

To solve the problems connected with pulsations and magnetic field variations further spectroscopic and photometric observations of V 474 Mon are extremely needed.

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