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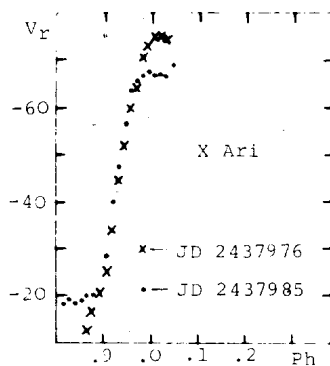
"ULTRA-VIOLET" BLAZHKO-EFFECT OF X Ari

The RRab star X Ari ($P=0^d.651$) was observed photoelectrically in UBV-system (ascending branches of light and colour curves) and simultaneously spectroscopically (descending branches of velocity curves) by Preston and Paczynski (1964).

During the analysis of metallic lines velocities we have discovered that velocity amplitudes are extremely different on JD 2437985 (50 km/sec) and on JD 2437976 (more than 63 km/sec) as one can see from the Figure. Observations during JD 2437918 repeat the velocity curve with maximal amplitude and those during JD 2438010 show the curve having intermediate amplitude (nearer to maximal one). One can suspect the Blazhko-effect for X Ari from these observations.

Nevertheless there is no correlation between B, V and B-V curves and metallic velocity curve variation. These light and colour curves have almost the same amplitudes (to several hundredth of a magnitude) during all nights.

However, we find some differences between U-B curves on different nights, though these differences are not large. It is possible to divide all U-B curves into two distinct groups by using four criteria: according to phases U-B colours equal to +0.03 and +0.05 mag. on ascending branches, +0.15 mag. on descending ones and U-B values at phase 0.0. We have found that the U-B curves corresponding to large and to small amplitude metallic velocity curves always belong to different groups. In particular, U-B curves on the nights JD 2437918 and JD 2437976 (large metallic velocity amplitudes) belong to the same group, whatever the criterion is. The U-B curve on JD 2438010 (intermediate velocity curve range) also belongs to the "large metallic ΔV_r group" but one on JD 2438017 (no velocity observations available) belongs to the opposite "small metallic ΔV_r group" where we also find the U-B curve on JD 2437985 (small metallic velocity range directly from spectroscopic observations). One can see that amplitudes



are the smallest ones on JD 2437985 and JD 2438017 due to systematically bluer U-B values around the phase 0.0.

It is interesting to note that just on JD 2437985 (metallic ΔV_r the smallest) and on JD 2438017 we found the brightest maxima of U light curves (9.45 and 9.47 mag., respectively). On JD 2437918 and JD 2437976 (metallic ΔV_r the largest) we found weaker U maxima (9.49 mag., the same as in the cases of JD 2437916 and JD 2438010).

Consequently, we can suppose we have three "moments" of large metallic ΔV_r (JD 2437918, 2437976, 2438010) and two "moments" of small amplitudes (JD 2437985, 2438017). Then, we can determine the intervals between these dates: 58, 34, 32 days. One can consider JD 2437945 as the "moment" of large metallic ΔV_r (three U-B criteria of four, and $U=9.53$ mag. in light maximum). If it is so, we obtain two intervals instead of one equal to 58 days: 27^d (JD 2437918-2437945) and 31^d (JD 2437945 - 2437976); these interval values are in accordance with the already obtained ones: 34^d and 32^d. So, now we can determine approximate value of the period of Blazhko-effect of X Ari: 31 days as mean from four values (27, 31, 34, 32 days).

Thus, we discovered the existence of unusual Blazhko-effect for X Ari which influences only U and U-B curves. So we can suppose the existence of some high temperature processes (for example shortwave recombination radiation produced by a shock wave in higher layers of stellar atmosphere) whose effectiveness is modulated with the period of about 31 days. We want to note that hydrogen velocities which are strongly influenced by shock wave kinematics in a higher stellar layers of X Ari, show the highest velocities of star contraction just on JD 2437985 (the smallest metallic ΔV_r). We can find only one determination of the hydrogen velocity of expansion on this night but it is the highest one, too, for this phase among all nights.

Prof. B.V. Kukarkin kindly communicated to me his idea that the coincidence of the existence of unusual Blazhko-effect and the very low metal abundance of X Ari may not be casual.

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