Time-resolved spectroscopy of the polar EU UMa (= RE1149+28) at the 6 m telescope

T.A. Somova[a], N.N. Somov[a], J.M. Bonnet-Bidaud[b], M. Mouchet[c,d]

[a] **Special Astrophysical Observatory of the Russian AS, Nizhnij Arkhyz 369167, Russia**
[b] **Service d'Astrophysique, CEN Saclay, CEA/DSM/DAPNIA/SAp, F-91191 Gif sur Yvette Cedex, France**
[c] **Observatoire de Paris-Meudon, F-92190 Meudon, France**
[d] **Universite Denis Diderot, Place Jussieu, F-75005 Paris Cedex, France**

Abstract.
We report the results of spectral and photometric observations of the new AM Her-type system EU UMa (=RE1149+28) obtained with the TV scanner and electrophotometer of Nasmyth-1 focus (NEPh) of the 6 m telescope on February 14 and 15, 1993. During our observations the system was of $V = 16^m.57 \pm 0.13$ and $V \quad 17^m.20 \pm 0.10$. As a result of spectroscopy with a temporal resolution of 5 min and spectral resolution of 2 Å, an analysis of the variability of the profiles, equivalent widths, central intensities, halfwidths and radial velocities of the emission lines $H\beta$, $H\gamma$, HeII 4686 Å during the orbital period was made. The analysis has shown the presence of appreciable changes in the parameters of the lines depending on the orbital period phase. The radial velocity curves measured for the peaks and centers of gravity of the emission lines have been constructed. From the measurements of the radial velocities of the peaks of $H\gamma$ it follows that the orbital period of the system is 90.0 ± 0.5 min. The equivalent width and relative intensity curves exhibit two sharp maxima at phases 0.15 and 0.85, i.e. separated by a 72.5 min interval (the start time of our exposure UT=00:51:27 corresponds to zero of phase which is computed using our best period determination of 90.0 min.). Broadening of all lines together with decreasing of equivalent widths and relative intensities occur near phase 0.5. In the range of phases 0.56-0.61 the lines practically disappear. The radial velocity curve of the narrow component of the HeII 4686 Å line is a sinusoid with a period of 74.9 ± 2.8 min, which correlates with the separation of the peaks on the curves of the distribution of the equivalent widths and central intensities of the Balmer emission lines with orbital period. This period probably indicates that at least two regions contribute to the narrow component. These may be the heated hemisphere of the red dwarf and part of the horizontal stream.