RevMexAA (Serie de Conferencias), **20**, 269–269 (2004)

NEW SPECTROSCOPIC OBSERVATIONS OF DWARF NOVA BZ URSAE MAJORIS WITH EXTREMELY UNUSUAL EMISSION LINES PROFILES

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We present preliminary results of new spectroscopic observations of dwarf nova BZ UMa in quiescence. Fifty medium resolution spectra allow us to reproduce the radial velocity curve from the Hα emission line. We confirm that BZ UMa shows extremely unusual emission lines profiles. Unlike the classical single or the double-peaked profiles usually observed in spectra of dwarf novae, emission lines of BZ UMa consist of at least five peaks.

BZ UMa is a little-studied dwarf nova discovered by Markaryan (1968), whose orbital period has been determined later as 97.8 minutes (Ringwald et al. 1994; Jurcevic et al. 1994). Here we present the preliminary results of new time-resolved, medium resolution (~2.5Å) Hα spectroscopic observations of dwarf nova BZ Ursae Majoris in quiescence.

There have been only a few determinations of the radial velocity semi-amplitude K_1 and the γ-velocity of the WD in BZ UMa. Derived values of K_1 are inconsistent with each other and range from 40 km s^{-1} (Ringwald et al. 1994) to 73 km s^{-1} (Jurcevic et al. 1994). Fifty spectra, which were obtained during 2003 May 27–29 on the OAN/SPM 2.1m telescope, allow us to reproduce the radial velocity curve from the Hα emission line. We have determined K_1 to be 40±9 km s^{-1}, consistent with that measured by Ringwald et al. (1994).

The most unexpected result of our previous investigations of BZ UMa (Neustroev et al. 2002) was the discovery of the unusual line profiles which consisted of at least three peaks. New observations confirm that result and lead to a surprising conclusion: the emission lines of BZ UMa consist of five (and possibly more) peaks. The mean normalized spectrum of BZ UMa, shown in Fig. 1, is an average of all 50 spectra, corrected for wavelength shifts due to orbital motions. In order to check the reality of the multi-peaks profile structure, we also show the mean spectra for each night separately. It can be seen that the shape of all the mean profiles is similar and consists of several peaks. A comparison the origial profiles from different nights but for the same phase leads us to believe that most of peaks in profiles are real. These peaks produce a number (up to 8-9) of the emission sources in the Doppler maps. The interpretation of such complicated spot structure is ambiguous. The dominant features observed in the maps are two closely located spots. These spots and all the other emission sources are located far from the region of interaction between the stream and the disk particles. None of the theories predict the presence of any bright spots here, which are connected with such an interaction. We have no plausible explanation for this.

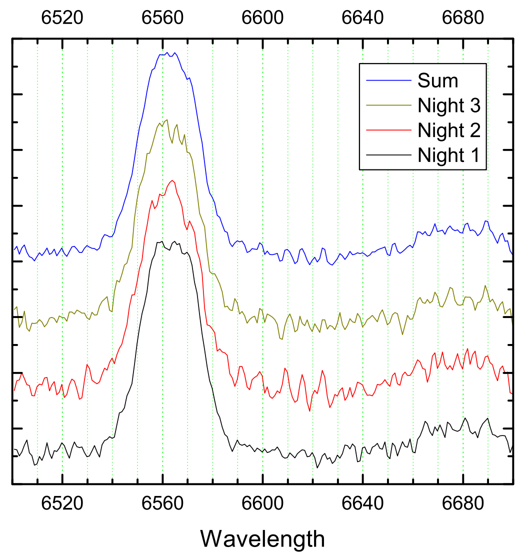

Fig. 1. The mean normalized spectrum of BZ UMa is an average of all 50 spectra, corrected for wavelength shifts due to orbital motions. The mean spectra for each night are shown separately.

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