

**Session: [B2A-3] S3 : Stars, Exoplanets and Stellar Systems**

**Date:** August 19, 2014 (Tuesday)

**Time:** 11:00~12:25

**Room:** Room C (Room 104)

**Chair:** Irina Voloshina (Sternberg Astronomical Institute)

**[B2A-3-1]**

**11:00~11:20**

**[Invited] Magnetic CV as a Bright Representative of Close Binaries**

Shengbang Qian (Chinese Academy of Sciences, China), Liying Zhu, Liang Liu, and Wenping Liao

Mass transfer is very important to understand the evolution and observational properties of close binary stars (CBs). Due to the lack of an accretion disk, eclipsing profiles of polars are the best source to study the character of mass transfer in CBs. In the past five years, we have monitored about 10 eclipsing polars (e.g., DP Leo and HU Aqr) by using several 2-m class telescopes and about 100 eclipse profiles were obtained. In this talk, I will review some progresses of our research group at YNOs. The first direct evidence of variable mass transfer in a CV is obtained and we show that it is the dark-spot activity caused the mass transfer in CVs. Magnetic activity cycles of the cool secondary were detected and we show that the variable mass transfer is not caused by magnetic activity cycles. These results will shed light on the structure and evolution close binary stars (e.g., CVs and Algols).

**[B2A-3-2]**

**11:20~11:40**

**[Invited] Accretion Processes in Cataclysmic Variables with Magnetic Field**

D. V. Bisikalo (Institute of Astronomy RAS, Russia)

We present a review of physical processes occurring due the mass transfer between the components of magnetic cataclysmic variables (mCV). Special attention is paid to the description of the magnetic field influence on accretion processes. In the frame of a self-consistent description of MHD flows in mCV we have derived the conditions of disk formation and found a criterion that splits two types of the flow, corresponding to intermediate polars and polars. We have also investigated variations of the main characteristics of the disks depending on the value of the magnetic induction and analyzed the process of magnetic field generation in the disks. In particular, it has been found that the quasi-periodic generation of the toroidal magnetic field in the disks leads to the alternation of accretion and decretion regimes in the inner regions of the disk. The main observational manifestations of the numerically found flow structure elements are also described.

**[B2A-3-3]**

**11:40~11:55**

**Period Variations of Superhumps in SU UMa Stars**

Akira Imada (National Astronomical Observatory of Japan, Japan) and Taichi Kato

We review recent results on superhump period variations in SU UMa-type dwarf novae. Our statistical studies have revealed that the evolution of the superhump period (Psh) is basically composed of three stages: stage-A during which the Psh is long and constant, stage-B during which Psh increases as the superoutburst proceeds, and stage-C during which Psh is short and constant. We also introduce a new method of estimating mass ratio using stage-A Psh. This method can extend to e.g., low mass X-ray binaries or AM CVn stars if stage-A Psh is well determined. Finally we briefly introduce our telescopes, instruments, and research members. This may motivate you to collaborate with our group.

**[B2A-3-4]**
**11:55~12:10**
**Dynamical Effects From Mass Transfer in Non-Magnetic CVs**

Michele M. Montgomery (UCF Physics, USA)

Mass transfer is ubiquitous in close binary systems. With higher potential energies transferring into higher kinetic energies, effects by mass transfer may include dynamics that may in turn modulate the light from the system. With the disk producing most of the light in non-magnetic Cataclysmic Variable (CV) systems, mass transfer effects may include disk tilt, warp, holes, plumes, etc. In this work, we review our latest 3D HD numerical simulation results and compare these results with those obtained from observations.

**[B2A-3-5]**
**12:10~12:25**
**BVR photometric Analysis of Intermediate Polar MU Cam**

Jiwon Park (Chungbuk National University, Korea), Joh-na Yoon, Yonggi Kim, and Ivan L. Andronov

Results of 46 night of CCD BVR photometry of the Intermediate Polar MU Cam obtained at 1m Telescope of LOAO and 60cm Telescope of CBNUO between 2005 and 2014 are presented. Using multi-periodic approximation and running approximation, times of extrema and the new ephemeris for the orbital and spin period:  $BJD(\text{spin})=2454085.50725(91)+0.013740942(13)\cdot E-1.15(10)\times 10^{-12}\cdot E^2$  and  $BJD(\text{orb})=2454085.46(19)+0.1966410(26)\cdot E$  Increasing the spin period is also confirmed through the O-C method as  $P=-2.20(14)\cdot 10^{-12}\text{s/s}$ . The periodogram analysis for 3 regions in V filter data and 4 regions in R filter data shows the existence of the beat frequency in the data of 2005-2006. This season corresponds to the low state and there are no beat frequency found in the high state, but the used data have no clear magnitude difference between the low state and high state. It is highly needed to get more accurate data in the further monitoring to make clear for the existence of the beat frequency. Period analysis for the new variables, V440 Cam and V442 Cam, found in the region of MU Cam provides the new orbital periods,  $P=1.^d151439$  and  $P=0.^d4426442$  respectively. Determining the physical parameters of these variables is also possible through an accurate photometry for these variables in the future.