RevMexAA (Serie de Conferencias), **49**, 90–90 (2017)

XV Latin American Regional IAU Meeting (Cartagena de Indias, Colombia, 3-7 October 2016)
Editors: Mario Armando Higuera Garzón & Santiago Vargas Domínguez

POORLY STUDIED PHENOMENA IN DOUBLE PERIODIC VARIABLES

R. E. Mennickent[1]

A brief summary is presented on poorly studied phenomena detected in the interacting binaries Double Periodic Variables.

Double Periodic Variables (DPVs) are a class of close interacting binaries characterized by a long photometric cycle lasting roughly 33 times the orbital period (Mennickent et al. 2003). Catalogs of DPVs in the Magellanic Clouds are provided by Poleski (2010) and Pawlak et al. (2013). A recent review including 21 Galactic DPVs is given by Mennickent, Otero, & Kołaczkowski (2016).

Loop in the color-magnitude (CM) diagram: After disentangling the long and short photometric cycles a loop in the CM diagram is observed during the long cycle of OGLE05155332-692558; the star rises to the maximum through the blue branch and descend to the minimum through the red branch; this was interpreted in terms of mass loss cycles (Mennickent et al. 2008). Extensive and multiwavelength photometric coverage of several targets is essential to clarify this phenomenon. This CM loop has only been documented in one DPV, but the whole OGLE database might be scanned to study further this phenomenon that mimics the loops observed in the eruptive cycles of some Be stars (de Wit et al. 2006). Color information for the LMC and SMC DPVs can be provided by MACHO and EROS projects. Multi-band photometric monitoring of bright Galactic DPVs can be done even with small size telescopes.

Discrete absorption components (DACs): They were reported in HI infrared lines of OGLE05155332-6925581 following some orbital patterns (Mennickent et al. 2008) and also in some metallic lines of V 393 Sco (Mennickent et al. 2012). In V 393 Sco a forest of blue-shifted and red-shifted DACs at the O I 7773 and Si II 6347 lines follows the donor RV during the orbital cycle while a few of them remain stationary. The DACs, that sometimes drops 5% below the continuum, are better visible in the first part of the orbital cycle. It is not clear how general this phenomenon is among DPVs neither its origin. High signal to noise spectra sampling the orbital cycle are needed to clarify this phenomenon.

[1]Departamento de Astronomía, Universidad de Concepción, Casilla 160-C, Concepción, Chile (rmennick@udec.cl).

Chromospheric line emission: It was detected in the donor of V 393 Scorpii and it is evident in the Doppler maps of the lines Mg II 4482 and C I 6588 (Mennickent et al. 2012). Spectra with high signal to noise ratio and good disentangling of additional spectral features (e.g. those of the hot star and the circumprimary disk) are needed to reveal these lines. It is not clear what is the incidence of chromospheric emission in DPVs but seems to be a relatively common phenomenon in the related systems Algols (Sarna, Yerli, & Muslimov 1998; Richards, Agafonov, & Sharova 2012).

Weird light curves: OGLE-LMC-DPV-097 shows deeper primary eclipses and the disappearance of secondary eclipses during long cycle minimum (Poleski 2010). OGLE-LMC-DPV-065 shows a decline of the long cycle length from 280 to 215 days in 4200 days (Poleski 2010). These phenomena are not common in DPVs, but could place constrains on competing models for the long cycle.

Acknowledgements: We thanks the support provided by grants VRID-Enlace 214.016.001-1.0 and BASAL Centro de Astrofísica y Tecnologías Afines (CATA) PFB–06/2007.

REFERENCES

de Wit, W. J., Lamers, H. J. G. L. M., Marquette, J. B., & Beaulieu, J. P. 2006, A&A, 456, 1027

Mennickent, R. E., Pietrzyński, G., Diaz, M., & Gieren, W. 2003, A&A, 399, L47

Mennickent, R. E., Kołaczkowski, Z., Michalska, G., et al. 2008, MNRAS, 389, 1605

Mennickent, R. E., Kołaczkowski, Z., Djurasevic, G., et al. 2012, MNRAS, 427, 607

Mennickent, R. E., Otero, S., & Kołaczkowski, Z. 2016, MNRAS, 455, 1728

Pawlak, M., et al. 2013, AcA, 63, 323

Poleski, R., Soszyński, I., Udalski, A., et al. 2010, AcA, 60, 179

Richards, M. T., Agafonov, M. I., & Sharova, O. I. 2012, ApJ, 760, 8

Sarna, M. J., Yerli, S. K., & Muslimov, A. G. 1998, MNRAS, 297, 760