

DETERMINATION OF ORBITS OF VISUAL BINARY AND LINEAR ELEMENTS OF DOUBLE STARS

Rade Pavlović¹, Zorica Cvetković¹, Svetlana Boeva² and Goran Damljanović¹

¹*Astronomical Observatory, Volgina 7, 11060 Belgrade, Serbia*

²*Institute of Astronomy and NAO Rozhen, Bulgarian Academy of Sciences,
72 Tsarigradsko Chausse Blvd., 1784 Sofia, Bulgaria*

E-mail: rpavlovic@aob.rs

Here we provide a brief overview of methods for determination of the orbital elements for visual binary stars. Koval'skij proposed as early as 1872 an analytical method. To obtain acceptable orbital elements by this method the observational data should cover the entire orbit within at least one period. Failing this, it often happens that real elliptic solution cannot be obtained. In order to enable this method to be applied even in cases where the observations cover a shorter arc of the orbit or there are gaps Olević (Olević, Cvetković 2004) introduced an improvement by using supplementary, fictive, observations.

We also provide a short description of the method for determination of linear elements for double stars which observations show a linear trend (Cvetković et al. 2012, Pavlović et al. 2013). We apply existing criteria for establishing the nature of this system, i.e. to answer to question if they are or not gravitationally bound.

We apply these methods onto several double stars which were observed at both, the Rozhen observatory and the Astronomical station at Vidojevica. Finally, we analyze the obtained results.

References

- Olević, D., Cvetković, Z.: 2004, *Astronomy and Astrophysics*, **415**, 259. Pavlović, R., Cvetković, Z., Boeva S., Vince O., Stojanović, M.: 2013, *Astronomical Journal*, **146**, 52
Cvetković, Z., Pavlović, R., Boeva S., Damljanović, G.: 2012, *Bulgarian Astronomical Journal*, **18(1)**, 56.