

## New orbits of wide visual double stars

Kiyaeva O., Romanenko L., Zhuchkov R.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

---

### Abstract

© 2017, Pleiades Publishing, Inc. Based on photographic and CCD observations with the Pulkovo 26-inch refractor, radial velocity measurements with the 1.5-m RTT-150 telescope (TUBITAK National Observatory, Turkey), and highly accurate observations published in the WDS catalog, we have obtained the orbits of ten wide visual double stars by the apparent motion parameter method. The orientation of the orbits in the Galactic coordinate system has been determined. For the outer pair of the multiple star HIP 12780 we have calculated a family of orbits with a minimum period  $P = 4634$  yr. Two equivalent solutions with the same period have been obtained for the stars HIP 50 ( $P = 949$  yr) and HIP 66195 ( $P = 3237$  yr). We have unambiguously determined the orbits of six stars: HIP 12777 ( $P = 3327$  yr), HIP 15058 ( $P = 420$  yr), HIP 33287 ( $P = 1090$  yr), HIP 48429 ( $P = 1066$  yr), HIP 69751 ( $P = 957$  yr), and HIP 73846 ( $P = 1348$  yr). The orbit of HIP 55068 is orientated perpendicularly to the plane of the sky,  $P > 1000$  yr. The star HIP 48429 is suspected to have an invisible companion.

<http://dx.doi.org/10.1134/S1063773717040041>

---

### Keywords

double stars, short-arc orbits

### References

- [1] C. Allen, *Allen's Astrophysical Quantities*, 4th ed., Ed. by A. N. Cox (Springer, Berlin, 1999).
- [2] G. A. Galazutdinov, Preprint Spets. Astrofiz. Observ. No. 96 (1992).
- [3] L. Girardi, A. Bressan, G. Bertelli, and C. Chiosi, *Astron. Astrophys. Suppl. Ser.* 141, 371 (2000).
- [4] W. I. Hartkopf, A. Tokovinin, and B. D. Mason, *Astron. J.* 143, 42 (2012).
- [5] The Hipparcos and Tycho Catalogues (ESA, 1997). <http://vizier.u-strasbg.fr/viz-bin/VizieR?-source=I/239>
- [6] J. Hopmann, *Mitt. Sternw. Wien* 9, 177 (1958).
- [7] J. Hopmann, *Astron. Mitt. Wien* 7, 253 (1971).
- [8] E. P. Horch, B. J. Baptista, D. R. Veillette, and O. G. Franz, *Astron. J.* 131, 3008 (2006).
- [9] I. S. Izmailov, M. L. Khovrichcheva, M. Yu. Khovrichchev, O. V. Kiyaeva, E. V. Khrutskaya, L. G. Romanenko, E. A. Grosheva, K. L. Maslennikov, and O. A. Kalinichenko, *Astron. Lett.* 36, 349 (2010).
- [10] I. S. Izmailov and E. A. Roshchina, *Astrophys. Bull.* 71, 225 (2016); <http://izmccd.puldb.ru/vds.htm>
- [11] E. Jofre, R. Petrucci, C. Saffe, L. Saker, E. A. de la Villarmois, C. Chavero, M. Gómez, and P. J. D. Mauas, *Astron. Astrophys.* 574A, 50 (2015).
- [12] A. A. Kisselev and L. G. Romanenko, *Astron. Soc. Pacif. Conf. Ser.* 316, 250 (2004).
- [13] A. A. Kisselev and O. V. Kiyaeva, *Sov. Astron.* 24, 708 (1980).
- [14] A. A. Kiselev and O. V. Kiyaeva, *Astron. Lett.* 29, 37 (2003).

- [15] A. A. Kisselev, O. V. Kiyeva, I. S. Izmailov, L. G. Romanenko, O. A. Kalinichenko, O. O. Vasil'kova, T. A. Vasil'eva, N. A. Shakht, D. L. Gorshanov, and E. A. Roshchina, *Astron. Rep.* 58, 78 (2014).
- [16] O. V. Kiyeva, *Sov. Astron.* 27, 701 (1983).
- [17] O. V. Kiyeva, *Izv. GAO RAN* 201, 44 (1985).
- [18] O. V. Kiyeva and N. A. Gorynya, *Astron. Lett.* 41, 417 (2015).
- [19] F. van Leeuwen, *Astron. Astrophys.* 474, 653 (2007).
- [20] B. D. Mason, G. L. Wycoff, W. I. Hartkopf, et al., *The Washington Visual Double Star Catalog* (US Naval Observ., 2016). <http://ad.usno.navy.mil/wds/>
- [21] D. L. Nidever, G. W. Marcy, R. P. Butler, and D. A. Fischer, *Astrophys. J. Suppl. Ser.* 141, 503 (2002).
- [22] R. L. Riddle, A. A. Tokovinin, B. D. Mason, W. I. Hartkopf, L. C. Roberts, Jr., C. Baranec, N. M. Law, K. Bui, et al., *Astrophys. J.* 799, 4 (2015).
- [23] A. A. Tokovinin, *ASP Conf. Ser.* 32, 573 (1992).
- [24] A. A. Tokovinin, *Astron. J.* 152, 10 (2016).
- [25] A. A. Tokovinin and O. V. Kiyeva, *Mon. Not. R. Astron. Soc.* 456, 2070 (2016).
- [26] A. Tokovinin, B. D. Mason, and W. I. Hartkopf, *Astron. J.* 139, 743 (2010).
- [27] A. Tokovinin, B. D. Mason, W. I. Hartkopf, R. A. Mendez, and E. P. Horch, *Astron. J.* 151, 153 (2016).