

Discovery of a New Double Star in Sagitta (HD 351106)

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Abstract: I found a secondary component of HD 351106. Because the separation complies with the Aitken criteria, HD 351106 could be a physical pair.

During my observations in constellation Sagitta, I found a secondary component of HD 351106 which is not listed in the WDS catalog [1] or in SIMBAD astronomical database [2]. HD 351106 is next to NSV 12668 (WDS 20001+1737, S 730), but is also not listed as a component of it. Figure 1 shows NSV 12668 with components and HD 351106, result of 46 stacked frames aligned to NSV 12668. Figure 3 is a POSSII image of these pairs.

HD 351106 has a brightness of 10.05 magnitudes. The difference between primary and secondary component is about 1 to 1.5 magnitudes. The distance is 3.63 arcseconds and the position angle is 260.8 degrees. The Bessellian date of observation is 2009.633.

If I assume a difference of 1.5 magnitudes, the brightness of the secondary is 11.55 magnitudes. This is in accordance with the sensitivity of my webcam. With this estimation the combined magnitude is 9.81 and as result the maximum angular separation is about 6.9 arc seconds. Because the measured distance is smaller than the maximum separation, Aitken's criteria is satisfied and HD 351106 could be a physical pair [3].

Figure 2 shows a 4-times magnified image with both components of HD 351106, which is the result of 29 stacked frames taken from video of NSV 12668. The 29 frames were aligned directly to HD 351106. The secondary component is also seen on the POSS2 image from the *Second Palomar Sky Survey*, but is not yet separated [2]. The proper motion of HD 351106 (19.40, 19.50) is very different from the proper motion

of NSV 12668 (4.10, 11.46) or the proper motion of 13 Sge (1.73,-12.22). Because of this, there is no physical relationship between them. The parallax of HD 351106 is unknown.

For my double star observations I use a small 8-inch Newtonian telescope with a focal length of 1500 mm. To record the observations I use a standard webcam [4, 5]. The reproduction scale of the optical system is about 0.794 ± 0.002 arc seconds / pixel. The analyses of the webcam videos will be made with *Reduc* software package.

Acknowledgements

This research has made use of the Washington Double Star Catalog maintained at the U.S. Naval Observatory. This research has also made use of SIMBAD astronomical database.

References

- [1] Brian D. Mason, Gary L. Wycoff, and William I. Hartkopf, The Washington Double Star Catalog, <http://ad.usno.navy.mil/wds/>
- [2] Centre de Données astronomiques de Strasbourg, SIMBAD astronomical object database: <http://simbad.u-strasbg.fr/simbad/>
- [3] Romero, Francisco Rica, "R.G. Aitken's Criterion to Detect Physical Pairs", *Journal of Double Star Observations*, Vol. 2 No. 1, 2006, Pages 36-41

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- [4] J. S. Schlimmer, "Double Star Measurements Using a Webcam", *Journal of Double Star Observations*, Vol. 3 No. 3, 2007, Pages 131-134
- [5] J. S. Schlimmer, "Double Star Measurements Using a Webcam: Annual Report of 2007", *Journal of Double Star Observations*, Vol. 4 No. 2, 2008, Pages 81-83

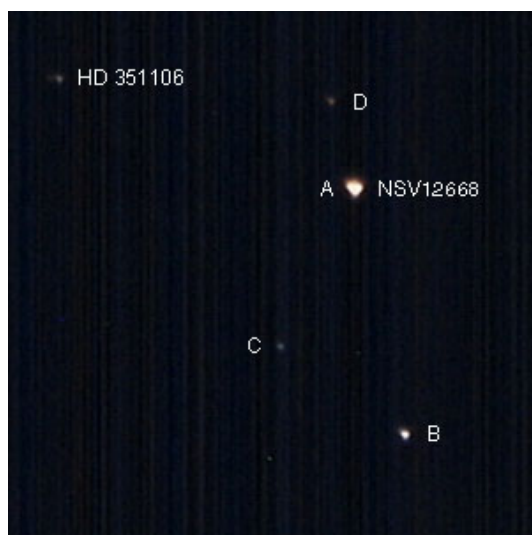


Figure 1: Image of NSV 12668 with HD351106 in upper left corner.

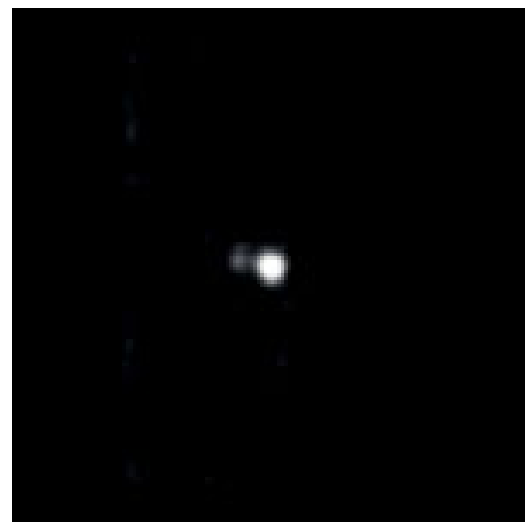


Figure 2: Image of HD351106 made from 29 stacked frames (see text).

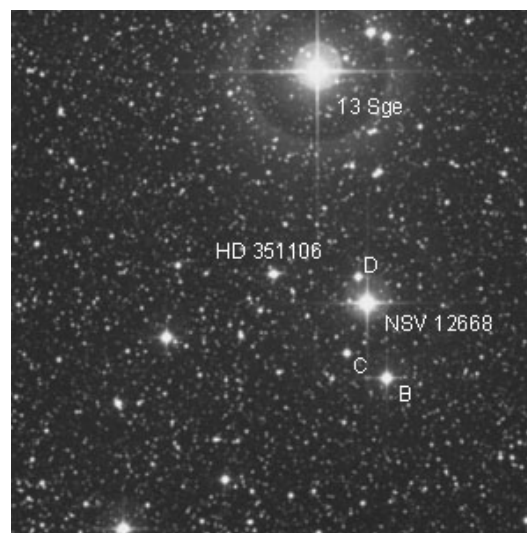


Figure 3: POSS II image of HD351106.