

Observation of Interesting Stellar Pairs in the Constellation Orion with a Possible New CPM Pair

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Abstract: In constellation Orion I observed interesting stellar pairs. Most of these stars have a similar brightness of about 10 magnitudes. An analysis of the proper motion between the components gives information of possible physical relationship between some of them.

During my observations in the constellation Orion I found two optical double stars which are not listed in the WDS catalog [1] or in the SIMBAD astronomical database [2]. Both double stars are next to FK2391.

The first double star is formed by TYC 1283-00166-1 and TYC 1283-00205-1. The distance is 31.4 arcseconds, the position angle is 152.4 degrees. Because their proper motion is very different, there is no relationship between them and we can expect both components to be an optical double star. This double star is shown in the left upper corner in Figure 1. Figure 2 shows the same area from POSS2 (The Second Palomar Observatory Sky Survey), taken from the SIMBAD database [2]. The names were added manually.

The second double star is only a distance of about 218" from TYC 1283-00166-1 above, that's why both double stars can be seen in the same image field. TYC 1283-00608-1 (9.70 mag) and TYC 1283-00586-1 (10.54 mag) occur as an optical pair. In figure 1 these components are marked as A and B. The distance between A and B is 36.7 arcseconds, the position angle is about 123 degrees. The proper motion between them is different, so there is probably no physical relationship.

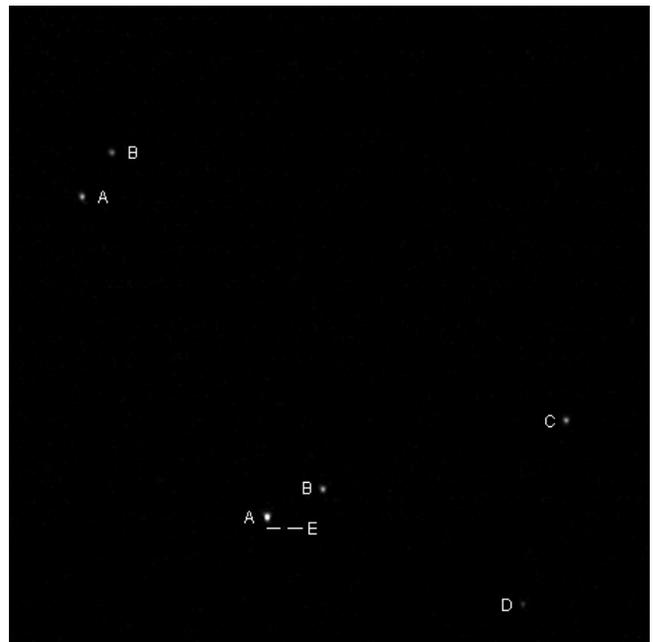


Figure 1: Stellar pairs in Orion, the image is a result of 50 stacked frames aligned to TYC 1283-00608-1.

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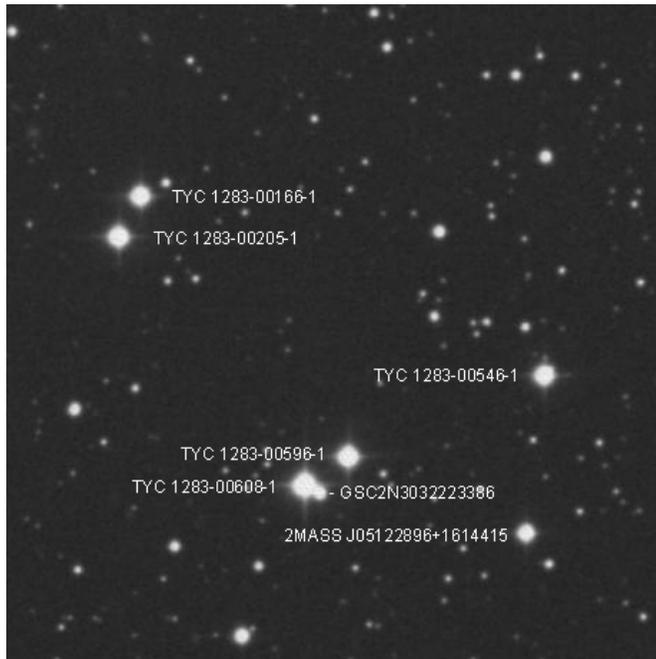


Figure 2: A POSS2 image of the same area, taken from SIMBAD database

At a distance of 185.0 arcseconds a third component C, TYC 1283-00546-1 with a magnitude of 10.15 can be seen. The proper motion is very similar to component A and therefore a physical relationship between the A and C components is possible.

A fourth component D (2MASS J05122896+1614415) is at a distance of 159.1 arcseconds. The position angle is 77.5 degrees. There is no information about proper motion in the SIMBAD database [2]. In comparison with my own measurements, component D has a different proper motion and we can expect it to be an optical component.

At a distance of 11.3 arcseconds, I found a fifth component E, which is named as GSC2N3032223386. The position angle is 65.2 degrees. This component is also seen on POSS2 image, see Figure 2.

Table 2: Names and FK5 coordinates

| | |
|--|----------------------|
| TYC 1283-00166-1 | 051209.230+161109.05 |
| TYC 1283-00205-1 | 051210.275+161040.81 |
| TYC 1283-00608-1 | 051218.158+161405.96 |
| TYC 1283-00586-1 | 051220.307+161346.26 |
| TYC 1283-00546-1 | 051229.952+161250.68 |
| 2MASS J05122896+1614415 GSC2N3032223386 | 051228.97 +161441.5 |

Because there is no further information about the parallax of these components, only the proper motion can be used for indication of possible physical relationships. Table 1 gives an overview of the components of both double stars. Table 2 shows the names and the FK5 coordinates, taken from SIMBAD database [2].

The double star observations are made with an 8-inch Newtonian telescope with a focal length of 1500 mm. The record of the observations was made with a webcam [3, 4]. Reproduction scale of the optical system is about 0.82 arc seconds / pixel. The analyses of the webcam videos was made with REDUC software package [5].

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/>

Table 1: Overview of the observed components

| Name | RA + DEC | Magnitudes | PA | Sep | Date | PM1 (mas/yr) | PM2 (mas/yr) |
|------------------|---------------|------------|--------|---------|----------|--------------|--------------|
| Double star 1 AB | 051209+161109 | 10.22 10.6 | 152.4° | 31.37" | 2011.076 | 48.1 -38.0 | 2.4 - 4.80 |
| Double star 2 AB | 051218+161406 | 9.70 10.54 | 123.0° | 36.75" | 2011.076 | 5.0 - 8.0 | 12.4 - 1.2 |
| Double star 2 AC | 051218+161406 | 9.70 10.15 | 114.2° | 185.03" | 2011.076 | 5.0 - 8.0 | 5.6 - 7.5 |
| Double star 2 AD | 051218+161406 | 9.70 | 77.5° | 159.09" | 2011.076 | 5.0 - 8.0 | 2.1 - 8.6 |
| Double star 2 AE | 051218+161406 | 9.70 | 65.2° | 11.28" | 2011.076 | 5.0 - 8.0 | |

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- [2] Centre de Données astronomiques de Strasbourg, SIMBAD astronomical object database: <http://simbad.u-strasbg.fr/simbad/>
- [3] J. S. Schlimmer, Double Star Measurements Using a Webcam, *Journal of Double Star Observations*, Vol. 3 No. 3, 2007, Pages 131-134
- [4] 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
- [5] Florent Losse, <http://www.astrosurf.com/hfosaf/uk/tdownload.htm>

