

Discovery of New Members of WDS 02137-0302, and -- WDS 02137-0302 B May Not Be Physical

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Abstract: The author discovered a new member of WDS 02137-0302 and judged from the parallax data of Gaia DR2 that WDS 02137-0302 B May not belong to this system.

Introduction

WDS 02137-0302 is composed of two components, A and B.

Gaia DR2 reported the A component to have a proper motion of $[24.703 \ -23.233]$ and a parallax $7.9959 (\pm 0.0497)$ milli-arcseconds (Gaia Collaboration, 2018). For the B component Gaia DR2 reported a proper motion of $[-46.898 \ -51.580]$ and a parallax $5.3825 (\pm 0.0549)$ milli-arcseconds (Gaia Collaboration, 2018).

Checking the Gaia DR2 data showed that 2MASS J02134399-0301246 is probably a member of the system. Let's call it C for the moment, Figure 1.

Gaia DR2 reported the C component to have a proper motion of $[25.779 \ -23.950]$ and a parallax $8.1425 (\pm 0.3425)$ milli-arcseconds (Gaia Collaboration, 2018).

Gaia DR2 measurements were also used to calculate the apparent separation (Sep) and the Position angle (PA). The Gaia DR2 astrometry measurements for these stars are summarized in Table 1.

Conclusion

According to the parallax data of Gaia DR2, we can exclude the correlation between B and A. The distance between the two is too far for them to be physical. C appears to be significantly closer. According to Gaia parallax, the distances to A and C are ~ 408 ly and 401 ly, respectively. If the uncertainty of measurement is taken into account, assuming C is at the same distance as A, the physical distance would be ~ 5050 AU. The highly similar proper motion between them, suggests that they are likely to be physical.

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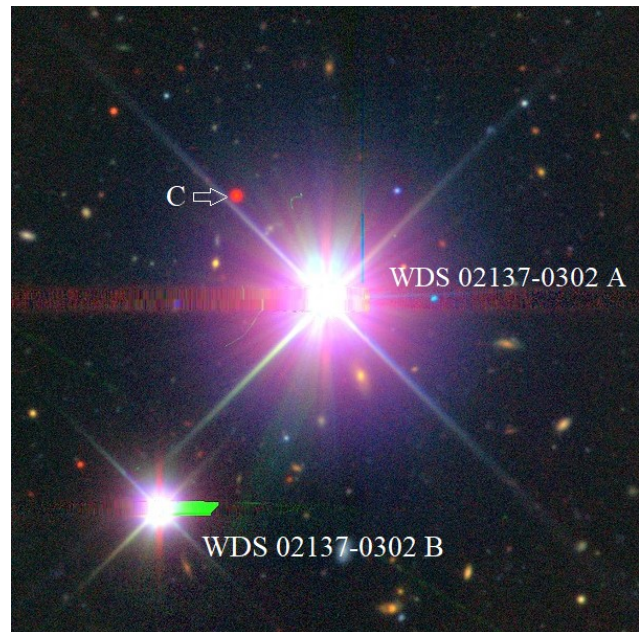


Figure 1. Discovery DECaLS DR5 image extract showing the group of three stars.

Acknowledgements

The following tools and resources have been used for this research:

- DECaLS DR5 images
- GAIA DR2 catalog
- Washington Double Star Catalog
- CDS VizieR

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Star	RA+Dec	Parallax	Plx_error	PM(RA)	PM(Dec)	Sep	PA
A	02 13 42.252 -03 01 55.66	7.9958	± 0.0497	24.703	-23.233	--	--
B	02 13 45.533 -03 02 57.31	5.3825	± 0.0549	-46.898	-51.580	78.842"	141.439°
C	02 13 44.017 -03 01 25.09	8.1425	± 0.3425	25.778	-23.950	40.417"	40.855°

Table 1. Gaia DR2 Astrometry

References

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