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

Guoyou Sun
Wenzhou Astronomical Association, China
dofur@hotmail.com

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 (±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 (±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 (±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 parallaxes, 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.

Acknowledgements
The following tools and resources have been used for this research:
• DECaLS DR5 images
• GAIA DR2 catalog
• Washington Double Star Catalog
• CDS VizieR

Received May 20, 2020.
Discovery of New Members of WDS 02137-0302, and -- WDS 02137-0302 B May Not Be Physical

<table>
<thead>
<tr>
<th>Star</th>
<th>RA+Dec</th>
<th>Parallax</th>
<th>Plx_error</th>
<th>PM(RA)</th>
<th>PM(Dec)</th>
<th>Sep</th>
<th>PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>02 13 42.252 -03 01 55.66</td>
<td>7.9958</td>
<td>±0.0497</td>
<td>24.703</td>
<td>-23.233</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>B</td>
<td>02 13 45.533 -03 02 57.31</td>
<td>5.3825</td>
<td>±0.0549</td>
<td>-46.898</td>
<td>-51.580</td>
<td>78.842&quot;</td>
<td>141.439º</td>
</tr>
<tr>
<td>C</td>
<td>02 13 44.017 -03 01 25.09</td>
<td>8.1425</td>
<td>±0.3425</td>
<td>25.778</td>
<td>-23.950</td>
<td>40.417&quot;</td>
<td>40.855º</td>
</tr>
</tbody>
</table>

*Table 1. Gaia DR2 Astrometry*

References


