

New Possible Pair Found in Centaurus Using DSS2 Imagery

Trygve Prestgard

Email: trygvpep@hotmail.fr

Abstract: While searching for Planetary nebulae candidates in DSS2 images, the author noticed a previously uncatalogued Double star in the Centaurus constellation. However, based on the values provided and derived from the Vizier database, it could be possible that this double star is an optical pair

While hunting for Planetary Nebulae in the Southern Hemisphere, I noticed an apparent high proper motion pair in the combined DSS2 (Red+Blue) images from the *Aladin Lite tool* (see figure 1). Both components had similarly (and clearly) changed position in-between the time the DSS2-Blue (1976) and the DSS2-Red (1992) image were taken. The primary is listed as UCAC3 90-147774 in SIMBAD while the companion is listed as UCAC4 225-067242 in Vizier. Their separation (ρ) was measured being $\rho = 11.2''$ based on UCAC4 (Zacharias et al. 2012).

Both UCAC3 90-147774 and UCAC4 225-067242 have a relatively similar proper motion according to the UCAC4 catalog in comparison to the nearby field stars (see figure 2). However, despite the similarity, the difference is still significant, even when taking into account the uncertainties. The same conclusion could be taken from the SPM 4.0 catalog (Girard et al. 2011). In DSS2 Blue images the Phase angle was measured to be around $\theta = 14^\circ$.

Using the UCAC4 catalog, I was able to deduce the Visual magnitude and B-V color index of UCAC3 90-147774 (see Table 1). Using the J and K band from the 2MASS catalog (Cutri et al. 2003), it was possible to indirectly deduce the B-V color of UCAC4 225-067242. Using the Blue magnitude provided by the USNO-B1.0 catalog (Monet et al. 2003), I was thus able to determine the visual magnitude of this component. However, this value is rather approximate, as the USNO Blue filters are not purely monochromatic. Comparing the calculated B-V color indexes of both components, there seemed to be a significant difference between the two. To see if this difference was caused by

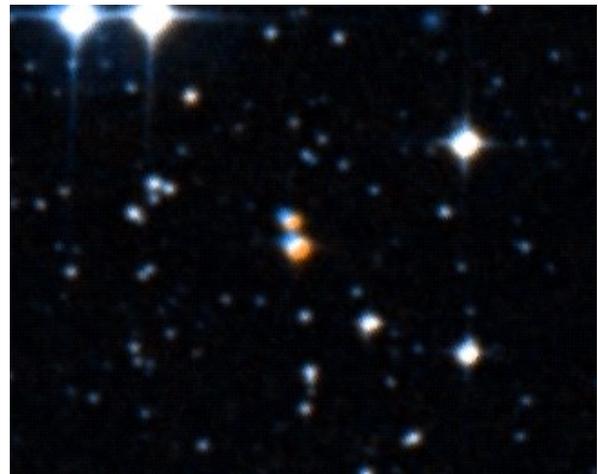


Figure 1. Discovery image DSS2 of the “UCAC3 90-147774 system”. Notice how the two components have an apparently similar high proper motion. Furthermore, notice how the primary seems to appear elongated in comparison to the field stars.

the difference in the methods used, the B-V index and the Visual magnitude for UCAC3 90-147774 were calculated again using the same indirect method that was applied to UCAC4 225-067242. The B-V index didn't vary much between the two different methods, but the visual magnitude differed by 0.5 magnitudes. It thus seems possible this difference in visual magnitude is caused by the approximate USNO-B1.0 Blue magnitude values. To make sure the primary wasn't variable in nature, a search was done through different catalogs (not including USNO), but no obvious variations could be found. Using the 2MASS catalog I was also able to

New Possible Pair Found in Centaurus Using DSS2 Imagery

Table 1. Results for Both Stars

Name	RA+Dec	PM (RA)	PM (Dec)	B-V	J-K	V Mag
UCAC3 90-147774	192.477 -45.084	-112.7	-118.3	1.61 1.59	0.90	+13.2 +12.7
UCAC4 225-067242	192.478 -45.081	-74.6	-99.0	1.34	0.81	+14.1

derive the J-K color indexes. Unexpectedly, the J-K index for UCAC4 225-067242 was greater than that of UCAC3 90-147774.

To sum up, despite this double star appearing interesting in DSS2 images, the B-V and J-K color indexes calculated in this work are not necessarily in favor of a binary system. The same can be said with the proper motion, despite appearing relatively similar when comparing them to the rest of the field stars. Furthermore, the visual magnitude derived for the companion star, UCAC4 225-067242, is likely very approximate. Further study is needed.

Acknowledgements

I wish to thank Brian Mason of the USNO/NRL/ Navy for his expertise and rapid response as well as Sebastian Otero (AAVSO) for having provided me with the tools allowing the magnitude conversions.

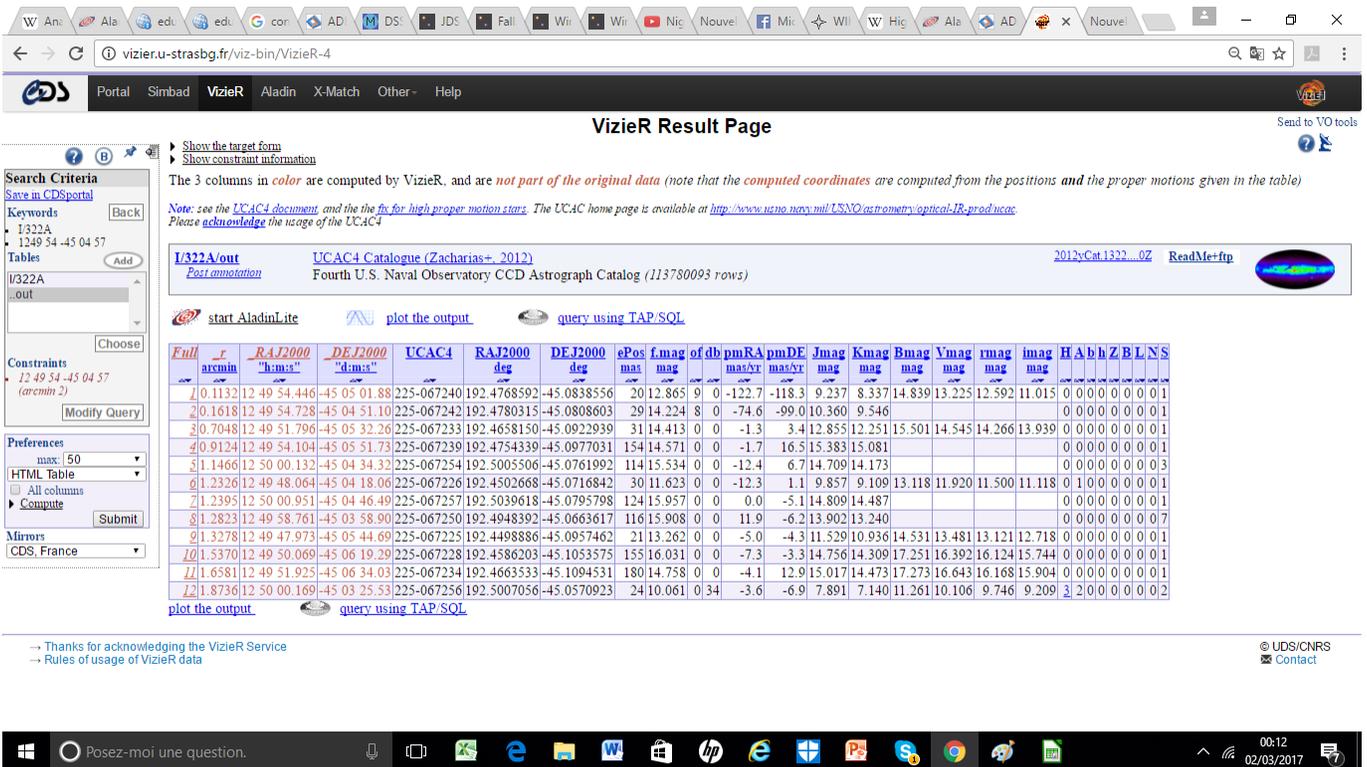


Figure 2: Screenshot from the Vizier database of the UCAC4 catalog. The two first lines are UCAC3 90-147774 and UCAC4 225-067242 respectively. Notice the similar range of proper motion these two stars have in comparison to the rest of the field stars.