

Catalog Access and New Lists of Neglected Doubles

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1. Catalog Access

The US Naval Observatory Websites are undergoing modernization and will be offline starting Thursday, 24 October 2019. The expected completion of work and return of service is estimated as 30 April 2020. Until that time, the only access to double star catalogs will be via our website mirrors:

- The Washington Double Star Catalog:
<http://www.astro.gsu.edu/wds/>
- Sixth Catalog of Orbits of Visual Binary Stars:
<http://www.astro.gsu.edu/wds/orb6.html>
- Second Catalog of Rectilinear Elements:
<http://www.astro.gsu.edu/wds/lin2.html>
- Fourth Catalog of Interferometric Measurements of Binary Stars:
<http://www.astro.gsu.edu/wds/int4.html>
- The Third Photometric Magnitude Difference Catalog:
<http://www.astro.gsu.edu/wds/dm3.html>
- IAU Commission G1 (Binary and Multiple Stars) webpage:
<http://www.astro.gsu.edu/wds/bsl/>
- Double Star Astronomy at the U.S. Naval Observatory:
http://www.astro.gsu.edu/wds/ds_history.html

2. Growth of the WDS and Data Mining

The availability of large astrometric catalogs and the admirable acumen of users has led to the republishing of the same measures and identification of the same “new” systems by multiple data-miners. This has significantly increased the amount of work needed to properly incorporate these data into the USNO double star catalogs. Therefore, in the future, data mining results will be added to the Washington Double Star (WDS) and Washington Double Star Supplement

(WDSS) Catalogs at the discretion of the catalogers.

Furthermore, preference will be given to data prepared by those specifically associated with the original catalog project.

As can be seen in Figure 1, the WDS and the other catalogs we maintain are being added to at a prodigious rate. A great deal of this work is coming from data mining, most recently from Gaia (DR2). While this can be useful, it is always there to be mined and based on some private discussions it is possible that the best and final Gaia astrometric solution will not be produced until DR4 or later, so to avoid current data mining efforts being eventually superseded and replaced, data mining of Gaia results is not recommended at this time.

3. What Needs to be Done?

Observe. Actual observations cannot be replicated. The observations you make tonight cannot be made tomorrow night or next week. Due to the slow motion of many of the pairs in the WDS and WDSS, to first order, the claim is absurd: the motion of most known visual pairs are insignificant and well below the measurement error on consecutive nights.

However, it does get to the crux of the issue: your observations are a unique dataset which cannot be replicated.

As a result, lists have been generated of pairs which need to be observed. These lists include pairs which either are unconfirmed or pairs which have not been measured in many years (“many” set arbitrarily at 20 years). In the initial formulation two lists have been generated:

- https://ad.usno.navy.mil/wds/Webtextfiles/neglected_list1.txt: List 1: Unconfirmed or (*date - last*) > 20yrs., $V_a < 12$, No X or K code systems.
- https://ad.usno.navy.mil/wds/Webtextfiles/neglected_list2.txt: List 2: as above, but no magnitude restrictions.

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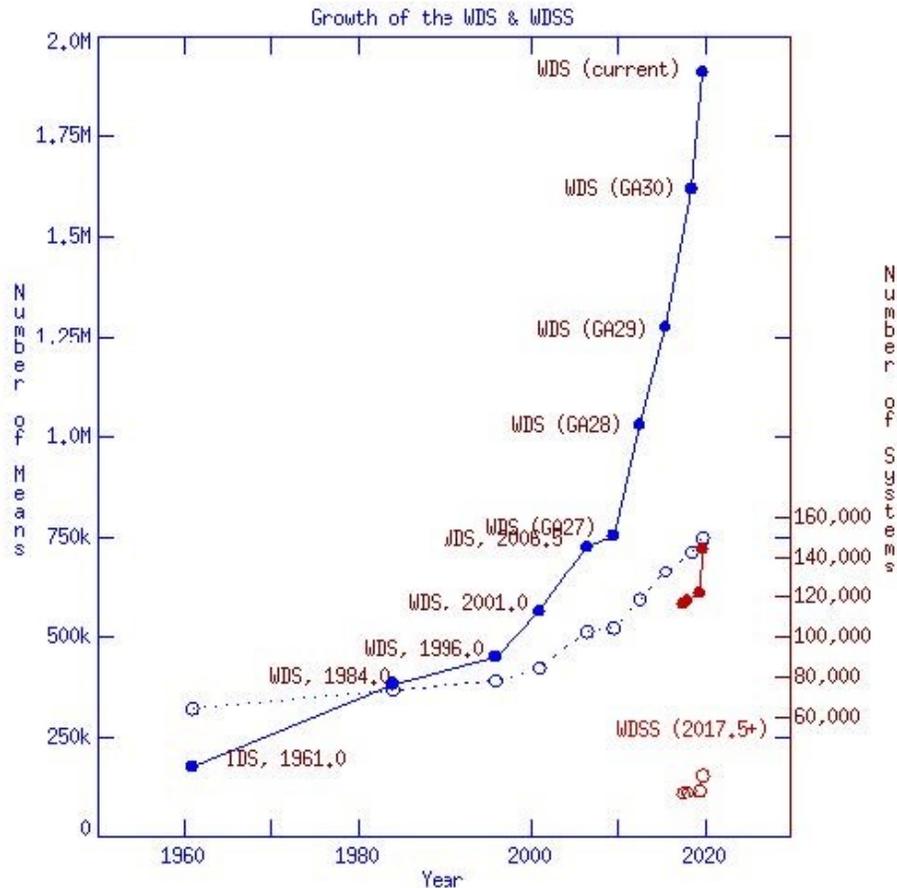


Figure 1. Growth of the WDS. The solid blue line and dots indicates the number of mean positions in the WDS, indicated on the left margin, at certain key dates. Indicated are publication of the IDS (1961), the major WDS data releases (1984, 1996, 2001, 2006.5), more recent dates corresponding to IAU General Assemblies (2009.5, 2012.5, 2015.5, 2018.5) and now (2019.75). The dashed blue line and open circles indicates the number of systems on those same dates and is indicated on the right margin. The solid/dashed red lines and filled/open red dots indicates growth of the new WDS Supplement at inception and later (2017.5, 2018.0, 2019.41, 2019.75), on the same scales as the WDS plots.

The above lists are in WDS summary line format and are also available at the WDS mirror website at the weblinks below. These files will be automatically updated from the WDS as new observations and systems are added. The update of the lists will occur at least monthly, but may occur more often.

- http://www.astro.gsu.edu/wds/Webtextfiles/neglected_list1.txt
- http://www.astro.gsu.edu/wds/Webtextfiles/neglected_list2.txt

For these neglected pairs, even a non-detection can be useful if your observing capability is much greater than the parameters of the pair in question. For the neglected pairs where (*date - last*) is a very large number, the pair may be lost or miscataloged, and it may involve detective work or the perusal of old articles. This type of investigative work may be found especially appealing.

Good observing!