CATALOGS
Understanding the 6th Orbital Catalog
Overview

When the WDS has a proposed orbital solution, it is added to the 6th Orbital Catalog.

All orbits are graded, and only those judged of highest grade for each system are included in the published Sixth Catalog.

If two orbits for a given system are judged to be of nearly identical quality, the earlier-published orbit is usually chosen for the catalog (unless the later orbit also includes formal errors to the elements).

A few systems are found to have two very different sets of orbital elements which yield comparable grades; in these cases both orbits are included. These "special cases" bring the total number of orbits in the current Sixth Catalog to 2,739.
Location in the WDS

6th Orbital Catalog Orbital Legend

Sixth Catalog of Orbits of Visual Binary Stars

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Locating the Orbital Files and Other Information

2015 Mar: The routine for generating ephemerides was extensively improved, with IAU expressions for Besselian epochs. This mainly affected predicted theta values at the 0.1deg level or smaller.

Contents:
- Introduction
- Orbit grading method
- Description of the catalog
- Catalog statistics
- Acknowledgments and references

- Orbital elements: html, text, sql (text file with delimiters)
- Ephemerides: html, text
- Notes: html, text
- References: html, text

- Orbital elements: frames version *

- Formats of elements and ephemerides files (text versions)
- Calibration Candidates
- Top 25 Orbit Calculators
- "Master file" database

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## Overview

### Sixth Catalog of Orbits of Visual Binary Stars: Orbital Elements

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<th>DD...........</th>
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### J2000 Coordinates & WDS Designation

### Catalog

### Period

### Grade, Notes, Figure, Ephemeris, References

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Orbit Grades

Orbits are graded 1-5 based on: (1=definitive to 5=indeterminate)

1 = Definitive.
   Well-distributed coverage exceeding one revolution; no revisions expected except for minor adjustments.

2 = Good.
   Most of a revolution, well observed, with sufficient curvature to give considerable confidence in the derived elements. No major changes in the elements likely.

3 = Reliable.
   At least half of the orbit defined, but the lesser coverage (in number or distribution) or data consistency leaves the possibility of larger errors than in Grade 2.

4 = Preliminary.
   Individual elements entitled to little weight, and may be subject to substantial revisions. The quantity $3 \log(a) - 2 \log(P)$ should not be grossly erroneous. This class contains: orbits with less than half the ellipse defined; orbits with weak or inconsistent data; orbits showing deteriorating representations of recent data.

5 = Indeterminate.
   The elements may not even be approximately correct. The observed arc is usually too short, with little curvature, and frequently there are large residuals associated with the computations.
Grade 1 Orbit

- Green plus signs indicate visual (micrometric) observations
- Violet asterisks photographic measures
- Blue symbols various interferometric techniques
  - Open circles – Eyepiece interferometry
  - Filled circles – Speckle or other single-aperture techniques
  - Filled squares - Multi-aperture techniques
- Red "H" or "T" indicates a measure from Hipparcos or Tycho
- Dot-dash line indicates the line of nodes
- Scales are in arcseconds
- Curved arrow at lower right indicates direction of orbital motion.
6th Orbital Catalog Orbital Legend

**Grade 1 Orbit**

- Green plus signs indicate visual (micrometric) observations
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Grade 5 Orbit

- Green plus signs indicate visual (micrometric) observations
- Violet asterisks photographic measures
- Blue symbols various interferometric techniques
  - Open circles – Eyepiece interferometry
  - Filled circles – Speckle or other single-aperture techniques
  - Filled squares - Multi-aperture techniques
- Red "H" or "T" indicates a measure from Hipparcos or Tycho
- Dot-dash line indicates the line of nodes
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Grade 5 Orbit: Short Arc Binary Candidate

- Green plus signs indicate visual (micrometric) observations
- Violet asterisks photographic measures
- Blue symbols various interferometric techniques
  - Open circles – Eyepiece interferometry
  - Filled circles – Speckle or other single-aperture techniques
  - Filled squares - Multi-aperture techniques
- Red "H" or "T" indicates a measure from Hipparcos or Tycho
- Dot-dash line indicates the line of nodes
- Scales are in arcseconds
- Curved arrow at lower right indicates direction of orbital motion.
Questions?