

The 9th catalogue of orbits of spectroscopic binaries

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on behalf of Comm. 26 SB9 WG

Goal and status

At the 2000 GA in Manchester, Commission 30 established a WG in charge of updating Batten's famous catalogues (SB8 dates back to 1989). WG moved to C26 in early 2013.

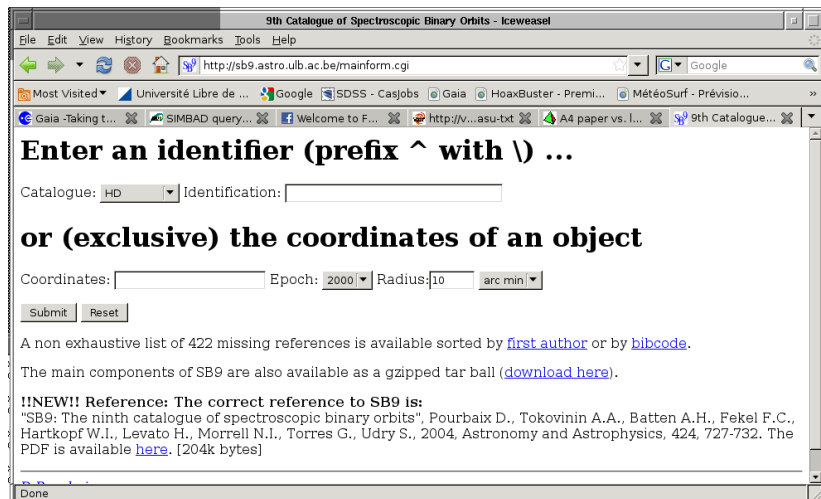
<http://sb9.astro.ulb.ac.be>

Five GA later,

- ▶ 3 479 systems (3 112; 2 946 (compared to 1 469 in SB8));
- ▶ 4 297 orbits (3 866; 3 608);
- ▶ 2 507 systems with radial velocities;
- ▶ 670 papers added (635; 591);
- ▶ Completeness: $\sim 60\%$ of systems with published orbits.

Reference: Pourbaix et al. 2004, A&A, 424, 727. (250 quotations)

Access through the web



The screenshot shows a web browser window titled "9th Catalogue of Spectroscopic Binary Orbits - Iceweasel". The address bar contains the URL "http://sb9.astro.ulb.ac.be/mainform.cgi". The browser's menu bar includes "File", "Edit", "View", "History", "Bookmarks", "Tools", and "Help". The search page features a form with the following elements:

- Header:** "Enter an identifier (prefix ^ with \) ... or (exclusive) the coordinates of an object"
- Form Fields:** "Catalogue:" with a dropdown menu set to "HD", "Identification:" with an empty text input field, "Coordinates:" with an empty text input field, "Epoch:" with a dropdown menu set to "2000", "Radius:" with a text input field containing "10", and a unit dropdown menu set to "arc min".
- Buttons:** "Submit" and "Reset" buttons.
- Text:** "A non exhaustive list of 422 missing references is available sorted by [first author](#) or by [bibcode](#)." and "The main components of SB9 are also available as a gzipped tar ball ([download here](#))."
- Footer:** "!!NEW!! Reference: The correct reference to SB9 is: 'SB9: The ninth catalogue of spectroscopic binary orbits', Pourbaix D., Tokovinin A.A., Batten A.H., Fekel F.C., Hartkopf W.I., Levato H., Morrell N.I., Torres G., Udry S., 2004, Astronomy and Astrophysics, 424, 727-732. The PDF is available [here](#). [204k bytes]"

The browser's status bar at the bottom shows "Done".

Web output

Basic data (System:154)

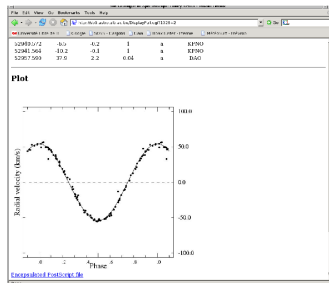
C1900.0 : 02576+5307
C2000.0 : 03044779+5330232
Comp. : A
Magn. : 2.94(V)
Spect. : G8III; A3V

Identifiers:

ADS 2324 Bayer δ gamma δ Per BD +52 654 Flamsteed 23 Per
HD 18925 HD 18926 HIP 14328 HR 815

Orbit

Element	Value	Std. dev.
Period (d.)	: 5329.89	1.68011
Periastron time (JDH-2,400,000.0)	: 32288.2	2.87563
Eccentricity	: 0.785648	0.0038
omega primary (deg.)	: 349.541	0.71
K1 (km/s)	: 13.8695	0.22
K2 (km/s)	: 18.5744	0.31
V0 (km/s)	: 3.12653	0.13
sigma residuals primary	: 1.49159	
sigma residuals secondary	: 2.52857	
#RV primary	: 208	
#RV secondary	: 96	
Grade	: 5.0	
Contributor	: PBX	
Status	: PUB	
Bibcode	: 1999A&A...348..127P	



6 330 plots retrieved since January 1st 2015.

Access through a tar ball

- Main.dta** : For each system, this table contains the 2000.0 coordinates down to hundredth of arc seconds in α and tenth of " in δ , the component identifier in case of multiple systems, the magnitude, corresponding filter and spectral type.
- Alias.dta** : Contains as many aliases as possible for each systems (main catalogues are favoured). Each line is an alias.
- Orbits.dta** : Orbital parameters, their uncertainties, bibcode, number of data points. Several orbits can be listed for the same system.
- Notes.dta** : Relevant information which matches none of the above.

The tar ball does **not** contain any radial velocity data.

215 copies have been downloaded since January 1st 2015.

External access

- ▶ USNO–WDS Catalog of orbits:
link to individual SB9 entries,



- ▶ Besançon Database of Double Stars (now moved to Moscow):
link to individual SB9 entries, periodic crosscheck of identifiers;

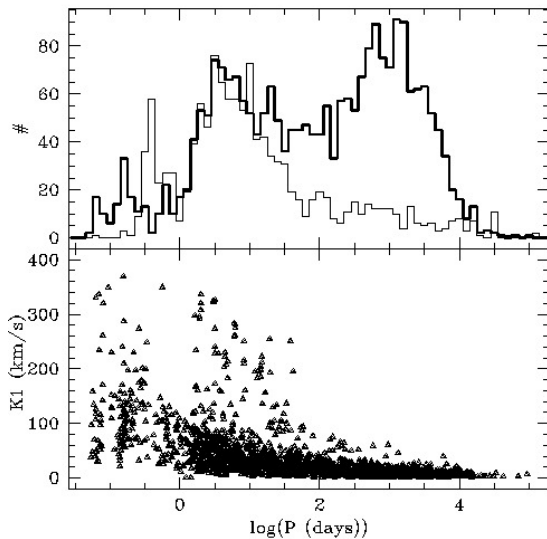


- ▶ Strasbourg–CDS: SB9 accessible through Vizier (content is cross-checked with Simbad). SB9 identifier in Simbad.

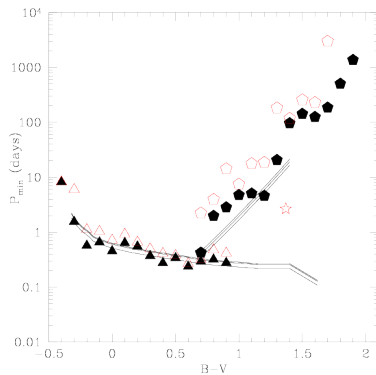
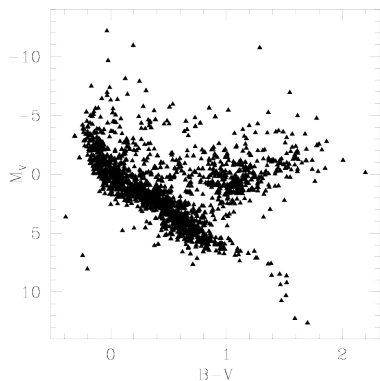


Win-Win situation

Application 1. Homogeneous to SB9



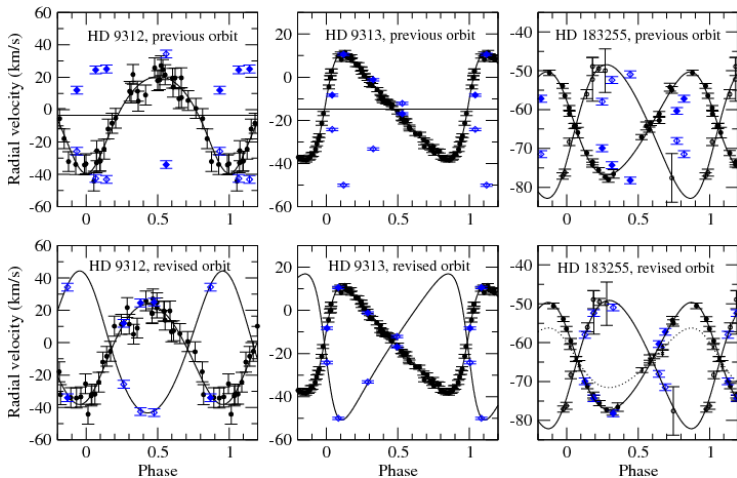
Application 2. Partly SB9



(Pourbaix et al, 2004, RevMxAA, 21, 265)

2 386 systems out of 3 479 belong to the Hipparcos and Tycho Catalogues.

Application 3. SB9 as a reservoir



(Halbwachs et al., 2014, MNRAS, 445, 2371)

Assessment of the completeness (Levato 2014.5)

- ▶ 6 141 lines with *ORB*, only 6 069 are distinct (biborb),
- ▶ 5 454 with distinct identifiers (first 26 positions of the lines)
- ▶ 1 687 distinct bibcodes
- ▶ biborb - bibcodes from Orbits yields 2 925 ORB lines missing from SB9
- ▶ At most 2 332 identifiers likely missing (completeness of 59.86+%)
- ▶ A substantial fraction of them are planetary systems!

Keep that in mind for your statistical studies!

Conclusion

Almost continuous progress despite

- ▶ lack of manpower,
- ▶ lack of spontaneous contribution from most authors of orbits
Authors do not see the benefit for their own publications yet!
One major exception: F. Fekel!
- ▶ increasing number of citations and queries: SB9 meets a need.

Future plans:

- ▶ Improve completeness with optimized upload
- ▶ Strengthen collaboration with CDS (search engine)

Any help is welcome!