

Dynamic versus Static Designation

Dimitri Pourbaix

Institut d'Astronomie et d'Astrophysique, Université Libre de Bruxelles

Abstract.

Should the designation of the components of a system reflect its known hierarchy or rather the history of their discovery? With the recent progress in, say, radial velocity techniques, the old famous order in which components were used to be discovered (inner to outer components for spectroscopic systems) is somehow altered. In the past, capital letters were used for visual companions and lower case letters for spectroscopic components and there was almost no overlap between the two groups. The situation has changed from both ends of the orbital period interval. In some rare cases, we think letters should be re-distributed and re-assigned in order to reflect the structure of the system. With an adequate choice of the data structure, such a change of the companion designation is rather straightforward to implement in modern databases (such as SB9²¹). The only foreseen drawback is related to the cross-reference with some old papers: the letter B would not designate the same component in a 1970 paper and in a 2003 one. For instance, the former secondary of an SB2 system might now refer to the unseen companion and an astrometric triple.

1. Comment, Post SPS3

Since Pourbaix could not come up with a robust example to illustrate his view, he decided to withdraw his contribution to this proceeding. Nevertheless, he is not convinced that the difficulty in finding an example should be seen as a hint of the weakness of his dynamical approach.

2. Discussion

URBAN: Changing designations is a poor idea and a logistical nightmare. Changing letter while new discoveries are made goes against the Commission 5 recommendations.

MASON: The 3:1 hierarchy Bob Harrington calculated assumed equal mass companions, which obviously breaks down in the case of the solar system. Clearly, it works better when all companions are stellar.

SCHMITZ: For a system like Sun-Pluto, does the designation need to change every time Pluto is closer to or further away from the Sun than Neptune.

²¹See The 9th Catalogue of Spectroscopic Binary Orbits website: <http://sb9.astro.ulb.ac.be/>

POURBAIX: Well, maybe you picked up the only counter-example in the Universe. However, as long as one would use the semi-major axis as the “distance indicator,” that is constant, even for Pluto.

TOKOVININ: The problem is: whether the designation should be fixed or meaningful. Attempts to code system hierarchy or component order fail to yield fixed designation. So, a designation should be kept fixed, and it can be made meaningful within this limit.

POURBAIX: If the component designation is part of the designation, we are indeed in trouble in the dynamic scheme I propose. However, as long as the designation refers to the system as a whole, the component designation is seen as a characteristic of the system and can thus be updated as often as needed.

Anyway, the component designation is already likely to change when the scheme is adopted for the whole sky. So the question is really whether one wants that change to be a one-shot or something more recurrent.

DICKEL: Designations need to be fixed. Changing data such as the spectral type or hierarchy is unrelated to the designation.

POURBAIX: The question is indeed whether we want the component to be part of the designation or not. In the affirmative, updating the letter(s) would mean a hard time for everybody. Otherwise, it is as simple as updating the spectral type.

HARTKOPF: When pairs are discovered by two techniques (e.g., one calls it AB, the other BA) one designation **HAS** to change.

HARTKOPF: Possibly the designations should be tied to date, i.e., the “J” before the WMC gives the date of the hierarchy determination as well.