The Galactic O-Star Spectroscopic Survey (GOSSS): New results from the southern stars

Alfredo Sota[1], Jesús Maíz Apellániz[1], Rodolfo H. Barbá[2], Nolan R. Walborn[3], Emilio J. Alfaro[1], Roberto C. Gamen[4], Nidia I. Morrell[5], Julia I. Arias[2], and Miguel Penadés Ordaz[1]

[1]Instituto de Astrofísica de Andalucía – CSIC, [2]Universidad de la Serena, [3]Space Telescope Science Institute, [4]Instituto de Astrofísica de la Plata, [5]Las Campanas Observatory

The Galactic O-Star Spectroscopic Survey (GOSSS, Maíz Apellániz et al. 2011) is a project that aims to observe all known Galactic O stars with $B < 14$ in the blue-violet part of the spectrum with R~2500. It is based on the most complete Galactic O star catalog with accurate spectral types (Maíz Apellániz et al. 2004, Sota et al. 2008) ever compiled. We have completed the first part of the main project and recently published the first articles (Walborn et al. 2010, Walborn et al. 2011, and Sota et al. 2011).

GOSSS is part of a bigger project with the following companion surveys:

High resolution spectroscopic surveys: OWN, IACOB, IACOB-sweG, NoMaDS, CAFÉ-BEANS

High resolution imaging surveys: Astralux

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Northern Stars

In our recently published paper "*The Galactic O-Star Spectroscopic Survey. I. Classification System and Bright Northern Stars in the Blue-Violet at R~2500*" (Sota et al. 2011, Paper I) we introduced a new atlas of the blue-violet spectral classification standards at R ~ 2500. On the basis of our extensive sample of high-quality digital data in hand, we have reviewed the classification system and introduced several refinements designed to improve the accuracy and consistency of the spectral types. These include the routine use of luminosity class IV at spectral types O6-O8, and most importantly, a redefinition of the spectral-type criteria at late-O types so that they are uniform at all luminosity classes for a given subtype. As a consequence, some objects previously classified as B0 have moved into the newly defined O9.7 type for classes V through III, expanding the definition of the O spectral category. The list of standard spectra that define the system has been revised and expanded, including representatives of the new subcategories, although a few gaps in the two-dimensional grid remain to be filled from future observations.

Current state

The survey can be divided in two stages:

1. 370 O stars form the first version of the Galactic O-Star Catalog (GOSC, Maíz Apellániz et al. 2004) that includes all O stars with B<8 and some fainther. This stage has been completed and a first paper with 184 bright Northern stars has been publised (Sota el al. 2010). The preliminary results of a second paper (to be submitted later this year) with ~200 bright Southern stars are presented here.
2. An additional ~3400 O and B0 stars from the actual version of GOSC with $B < 14$ from which more than 1200 have already been observed.

The Northern part of the survey is being carried out from the Sierra Nevada observatory (OSN), the Calar Alto observatory (CAHA), and the William Herschel Telescope (WHT) in Spain. The Southern part is being carried out from Las Campanas observatory (LCO) in Chile.

New results from the southern bright stars (Paper II)

1. An extension of the sample of standard stars to cover holes in the grid and to include the early B stars and the hypergiants. Some standards from the Magellanic Clouds have been included.
2. An analysis of the disparity between different luminosity criteria for some late-O stars.
3. A definition of spectral subtype O9.2 in an analogous manner to the new definition for 30 Doradus stars (Walborn et al. 2013).
4. Accurate and homogenous spectral classifications for the full ~200 stars sample. Paper I + II include all known O stars with $B < 8$.
5. A number of new peculiar objects. See Figs. 1 and 2 for examples.

Fig. 1. Southern Stars. A new LBV and two new SB2s.

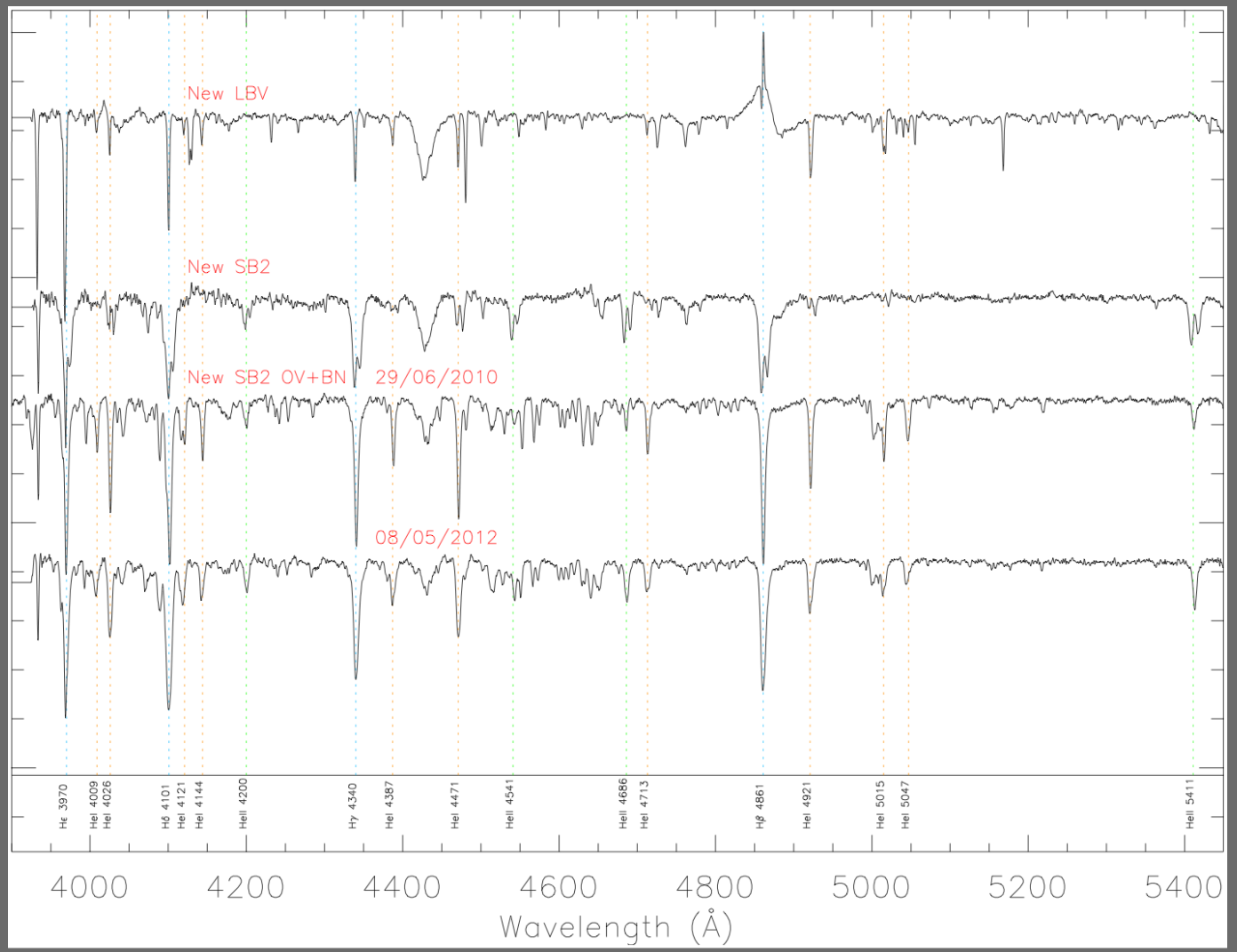

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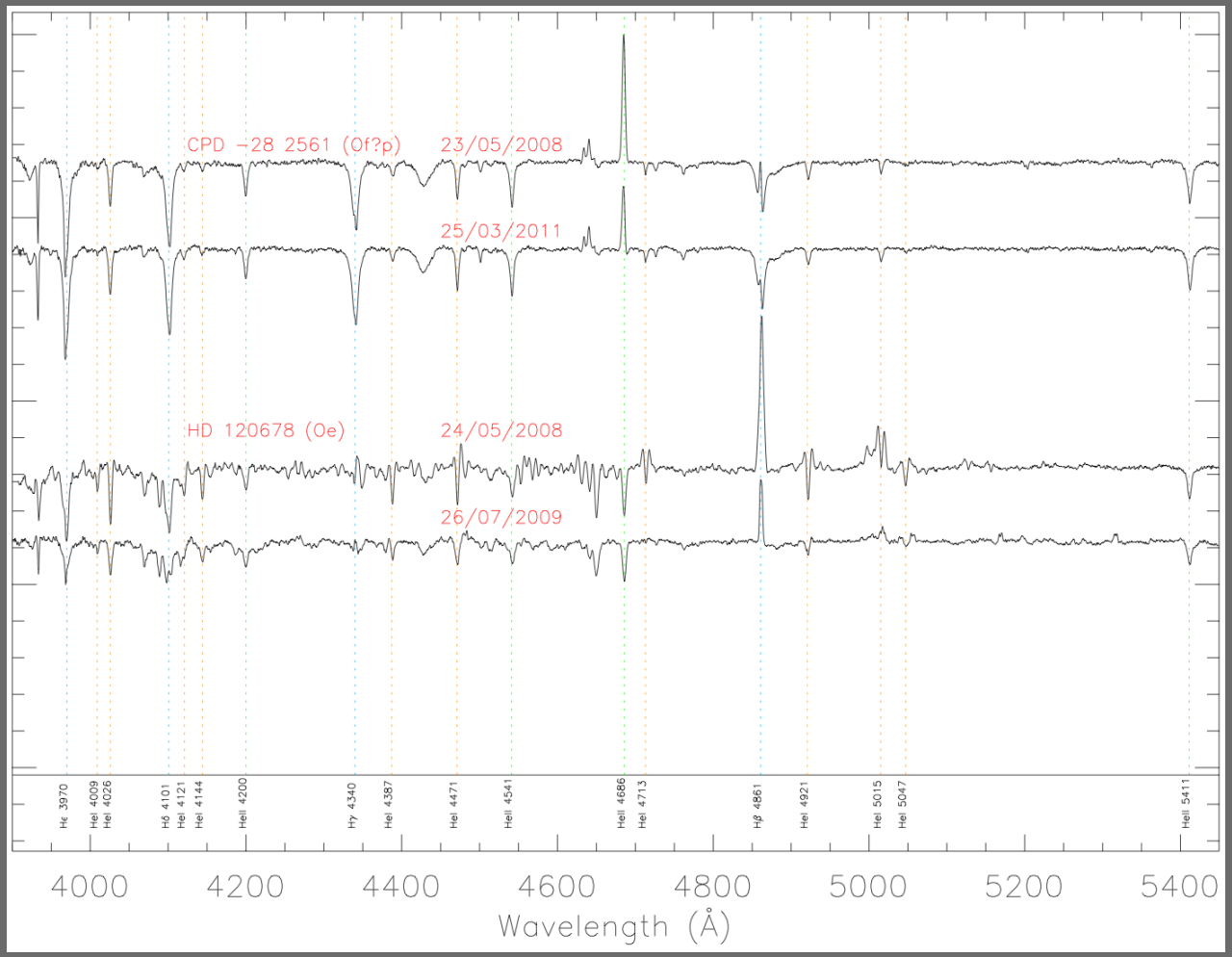
Fig. 2. Southern Stars. Interesting objects

HD 120 678 -> Oe shell event (Gamen et al. 2013).

CPD -28 2561 -> Of?p star discovered by GOSSS (Walborn et al. 2010). Now it has a detected magnetic field (Wade et al. 2013).



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