

MONOS:

MULTIPLICITY OF NORTHERN O-TYPE SPECTROSCOPIC SYSTEMS



Credit NASA, ESA y Jesús Maíz (CAB)

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MONOS (north) and MOSOS (south) are part of an ambitious project that aims to perform a homogeneous study of all known Galactic O-type spectroscopic binaries. We are analyzing their spectral and visual properties and its spectroscopic binary status.



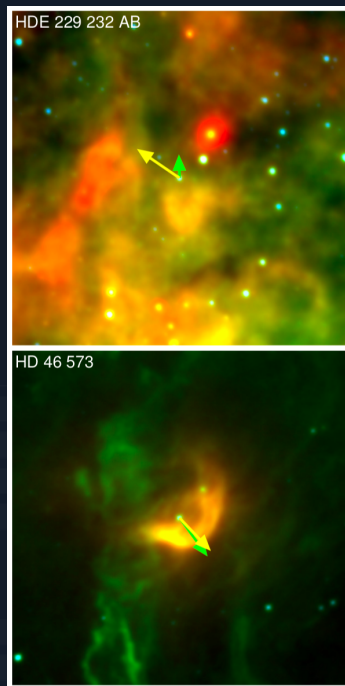
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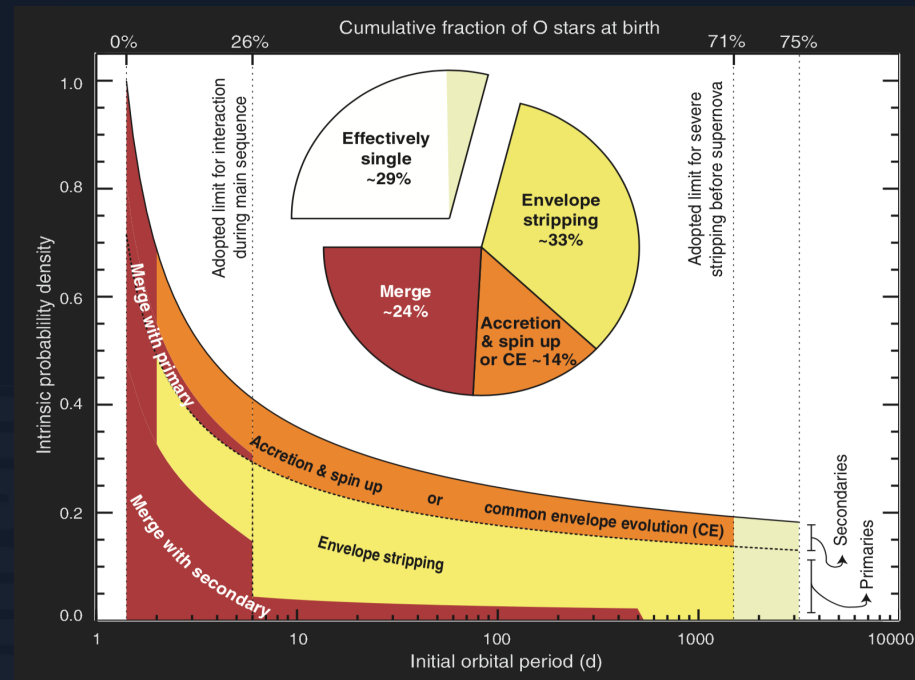
CONTEXT

Whether studying high redshifted galaxies, planetary nebulae or massive stars, multiplicity is a critical factor in stellar and galactic evolution not fully understood yet. Multiplicity is an endemic property of massive stars, especially highlighted in O-type stars.

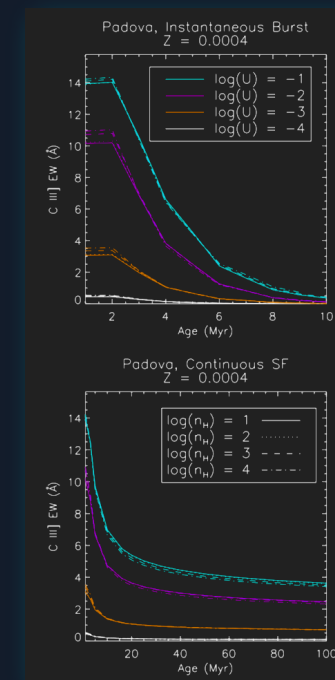
O-type stars are essential ingredients to understand the evolution, both chemical and dynamical, of a galaxy due to its enormous effects on their surroundings during their brief but brilliant life (e.g. through ionising effects, stellar winds, etc.) and their deaths after SN explosions.



[J. Maíz Apellániz et al. 2018a](#)

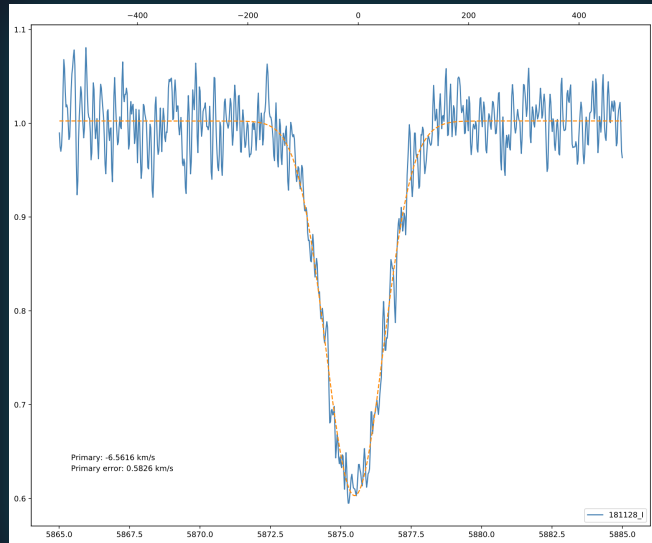


[Sana 2012](#)



[Jaskot & Ravindranath 2016](#)

DESCRIPTION & METHODOLOGY



CAFÉ-BEANS

[I. Negueruela et al. 2015](#)



LiLiMaRlin
Library of Libraries of Massive-Star High-Resolution Spectra

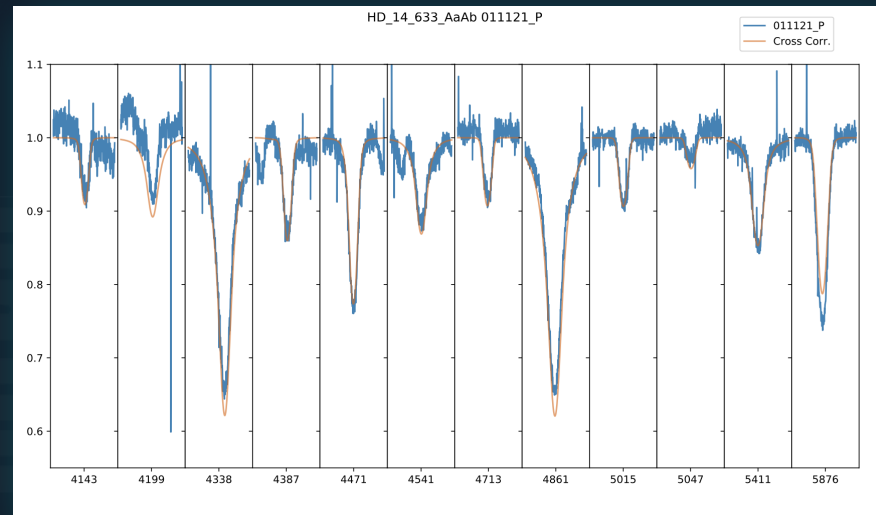
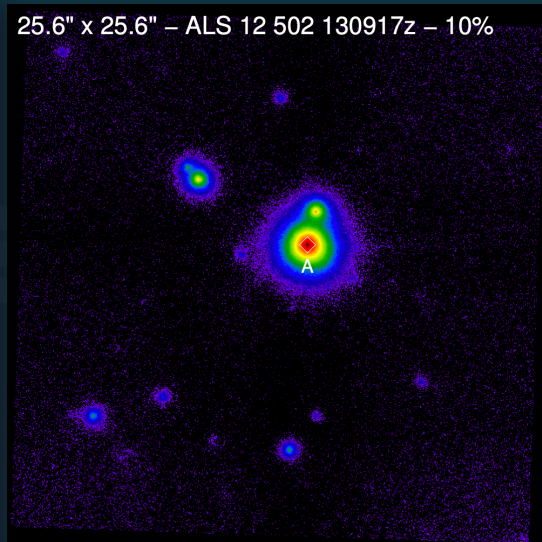
[J. Maíz-Apellániz et al. 2018c](#)

- Spectroscopic data from our surveys and different databases, unified in the LiLiMaRlin library.

- Radial Velocity measurements

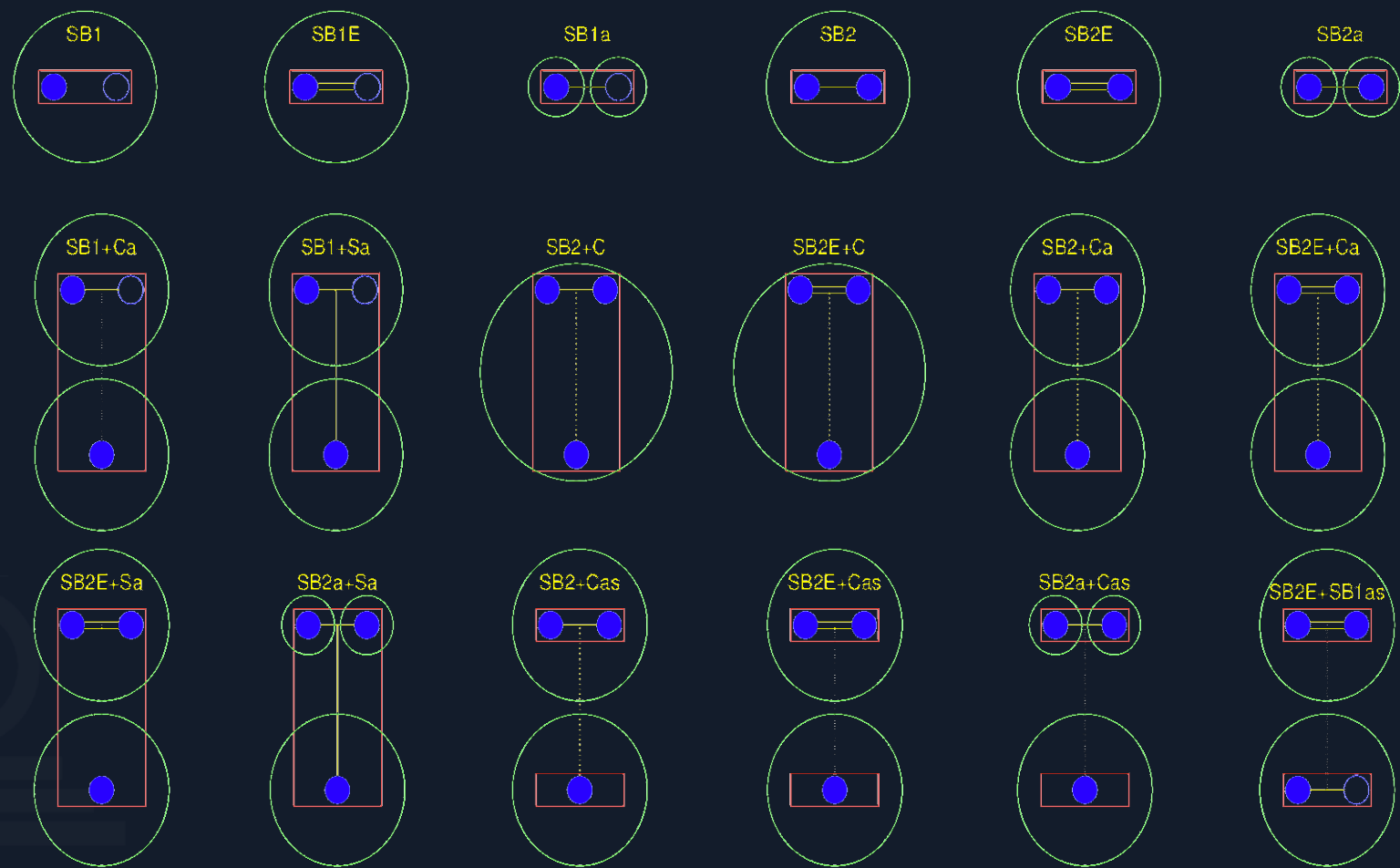
- Gaussian fits
- Centroid measurement
- Cross-Correlation with FastWind Models

- Lucky Imaging (AstraLux)



MONOS-I: PROJECT DESCRIPTION & SPECTRAL CLASSIFICATIONS & VISUAL MULTIPLICITY OF PREVIOUSLY KNOWN OBJECTS

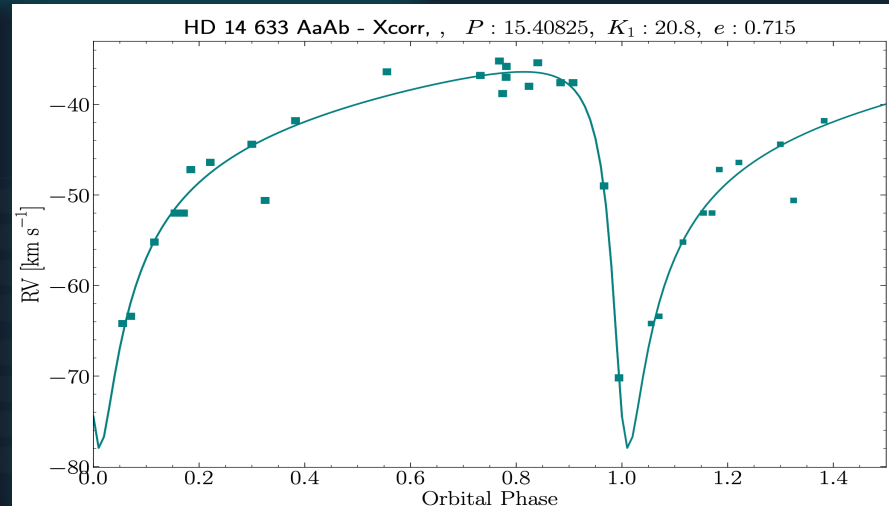
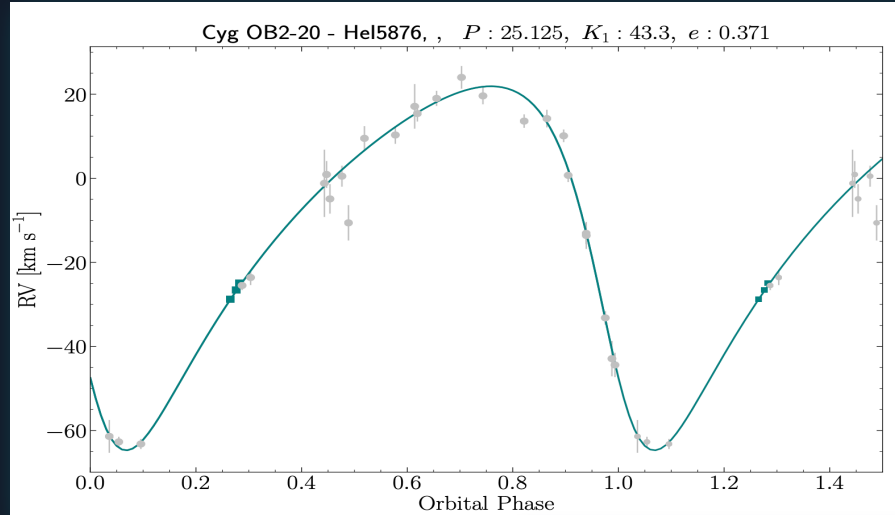
- Spectroscopic classifications and visual multiplicity information for 92 multiple systems with $\delta > -20$
- Nine new astrometric companions and provide updated information on several others.
- SBS classification (spectroscopic binarity status).



[J. Maiz-Apellaniz et al. 2019](#)

RESULTS

PROJECT DESCRIPTION & SPECTRAL CLASSIFICATIONS & VISUAL MULTIPLICITY OF PREVIOUSLY KNOWN OBJECTS : MONOS-II



- RV analysis and review of 32 SB1 systems.
- 10 new RV orbital solutions.
- 6 objects (15% of the sample) reclassified as RV variables (probable pulsations) but no SB1.

FUTURE WORK

The MONOS and MOSOS projects are in progress.
Next steps

- Analysis of the SB2 binaries
- New O+OBcc binaries

