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Quantitative Spectroscopic Analysis of O stars in the IACOB+OWN project: Massive stars in the Galaxy with GAIA-DR3.

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Abstract

Massive stars are luminous beacons that help us to extract information about the star formation history and the chemodynamical evolution of galaxies in the Universe. Our Galaxy is full of massive stars, which expend their short-lived existence within bright star-forming regions, depositing huge amounts of mechanical and radiative energy to the interstellar medium before they explode as energetic supernovae event. They are also the origin of the recently detected phenomena of gravitational waves, with the merger of a pair of their typical end products: black holes or neutron stars.

The IACOB and OWN projects have collected a large database of high-resolution multi-epoch spectra of Galactic O and B-type stars, ∼10000 spectra for more than 1000 OB stars. This unique spectroscopic dataset, once analyzed and interpreted with state-of-the-art tools and techniques will provide a new, global overview of the physical and evolutionary properties of massive stars in their early phases.

In this contribution, I will present the results from the quantitative spectroscopic analysis of ∼300 O stars targeted by the IACOB and OWN surveys (implying the largest sample of O Galactic O stars analyzed homogeneously, using modern automatized tools). I will put special emphasis on highlighting the impact of the GAIA mission in the determination of physical parameters of massive stars, with distance calculation of unprecedented precision for these bright objects. With this, we intend to revisit calibrations of stellar parameters with spectral type and luminosity class, and provide a homogeneous and statistically significant empirical anchor of the physical attributes of Galactic O-type stars.

My poster is available at https://doi.org/10.5281/zenodo.7005255