

OB stars at the lowest Local Group metallicity. GTC-OSIRIS observations of Sextans A

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Context: Massive stars play an important role in the chemical and dynamical evolution of the Universe. The first metal-poor stars may have started the reionization of the Universe. To understand these early epochs it is necessary to know the behavior and the physical properties of massive stars in very metal-poor environments. We focus on the massive stellar content of the metal-poor irregular galaxy Sextans A.

Aims: Our aim is to find and classify OB stars in Sextans A, so as to later determine accurate stellar parameters of these blue massive stars in this low-metallicity region ($Z \approx 0.1 Z_{\text{sun}}$).

Methods: Using UVB photometry, the reddening-free index Q and GALEX imaging, we built a list of blue massive star candidates in Sextans A. We obtained low-resolution ($R \approx 1000$) GTC-OSIRIS spectra for a fraction of them and carried out spectral classification. For the confirmed O-stars, we derived preliminary stellar parameters.

Results: The target selection criteria and observations were successful and have produced the first spectroscopic atlas of OB-type stars in Sextans A. From the whole sample of 18 observed stars, 12 were classified as early OB-types, including 5 O-stars. The radial velocities of all target stars are in agreement with their Sextans A membership, although three of them show significant deviations. We determined the stellar parameters of the O-type stars using the stellar atmosphere code FASTWIND and revisited the sub-SMC temperature scale. Two of the O-stars are consistent with relatively strong winds and enhanced helium abundances, although results are not conclusive. We discuss the position of the OB stars in the HRD. Initial stellar masses run from slightly below 20 up to 40 solar masses.

Conclusions: The target selection method worked well for Sextans A. The stellar temperatures are consistent with findings in other galaxies. Some of the targets deserve follow-up spectroscopy because of indications of a runaway nature, an enhanced helium abundance, or a relatively strong wind. We observe a correlation between HI and OB associations similar to the irregular galaxy IC 1613, confirming the previous result that the most recent star formation of Sextans A is currently ongoing near the rim of the HI cavity.

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