The young stellar population of IC 1613. III. New O-type stars unveiled by GTC-OSIRIS

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Recent findings hint that the winds of massive stars with poorer metallicity than the SMC may be stronger than predicted by theory. Besides calling the paradigm of radiation driven winds into question, this result would impact the predicted evolutionary paths of massive stars, their calculated ionizing radiation and mechanical feedback and the role these objects play at different stages of the Universe. The field needs a systematic study of the winds of a large set of very metal poor massive stars, but the sampling of spectral types is particularly poor in the very early types. This paper's goal is to increase the list of known O-type stars in the dwarf irregular galaxy IC1613, whose metallicity is smaller than the SMC's by roughly a factor 2.
Using the reddening-free Q-parameter, evolutionary masses and GALEX photometry, we built a list of very likely O-type stars. We obtained low-resolution R~1000 GTC-OSIRIS spectra for a fraction of them and performed spectral classification, the only way to unequivocally confirm candidate OB-stars. We have discovered 8 new O-type stars in IC1613, increasing the list of 7 known O-type stars in this galaxy by a factor of 2. The best quality spectra were analyzed with the model atmosphere code FASTWIND to derive stellar parameters. We present the first spectral type -- effective temperature scale for O-stars beyond the SMC. The derived effective temperature calibration for IC1613 is about 1000K hotter than the scale at the SMC. The analysis of an increased list of O-type stars will be crucial for the studies of the winds and feedback of massive stars at all ages of the Universe.

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