No breakdown of the radiatively-driven wind theory in low-metallicity environments

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We present a spectroscopic analysis of HST/COS observations of three massive stars in the low metallicity dwarf galaxies IC 1613 and WLM. These stars, were previously observed with VLT/X-shooter by Tramper et al. (2011, 2014) who claimed that their mass-loss rates are higher than expected from theoretical predictions for the underlying metallicity. A comparison of the FUV spectra with those of stars of similar spectral types/luminosity classes in the Galaxy, and the Magellanic Clouds provides a direct, model-independent check of the mass-loss - metallicity relation. Then, a quantitative spectroscopic analysis is carried out using the NLTE stellar atmosphere code CMFGEN. We derive the photospheric and wind characteristics, benefiting from a much better sensitivity of the FUV lines to wind properties than Ha. Iron and CNO abundances are measured, providing an independent check of the stellar metallicity. The spectroscopic analysis indicates that Z/Zsun = 1/5, similar to a SMC-type environment, and higher than usually quoted for IC 1613 and WLM. The mass-loss rates are smaller than the empirical ones by Tramper et al. (2014), and those predicted by the widely used theoretical recipe by Vink et al. (2001). On the other hand, we show that the empirical, FUV-based, mass-loss rates are in good agreement with those derived from mass fluxes computed by Lucy (2012). We do not concur with Tramper et al. (2011, 2014) that there is a breakdown in the mass-loss - metallicity relation.

Reference: MNRAS
Status: Manuscript has been accepted

Weblink: http://arxiv.org/abs/1502.05641

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