The Effective Temperatures and Physical Properties of O-type Stars at Low Metallicity

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Abstract

An accurate knowledge of the effective temperatures of O-type stars is the key to knowing their other physical properties. Improvements in stellar atmosphere models in the past few years have significantly reduced the deduced temperatures of Galactic O-type stars due to the effects of wind- and line-blanketing. At the lower metallicities of the SMC and LMC, blanketing should have a lesser effect, but there is considerable disagreement in the literature at present as to the effective temperatures scale for SMC and LMC O stars. We plan a comprehensive study using HST archive UV data supplemented by optical ground-based data recently obtained with the Magellan 6.5-m telescope. In addition to using improved data, our study will apply different models (FASTWIND and CMFGEN) to the same data-sets, and we will also separately and jointly determine physical parameters based upon the UV and optical spectra. This will lead to a much better understanding of where the any systematic differences originate. In the end, we expect to have not only a definitive effective temperature scale of low-metallicity O-type stars, but also a very realistic estimate of what the uncertainties are in that scale. This study will also serve as the impetus for long-term improvement in the stellar atmosphere models of hot luminous stars.

Investigators:

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Number of investigators: 6

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Dataset Summary:

Instrument	No. of Datasets	Retrieval Method	Retrieval Plan
FOS	16	FTP	overnight (files are small)
STIS	36	FTP	over a weekend