

A Detailed Far-Ultraviolet Spectral Atlas of O-Type Stars

Myron A. Smith

Catholic University of America

In this paper we present a spectral atlas covering the wavelength interval 930--1188Å for O2--O9.5 stars using Far Ultraviolet Spectroscopic Explorer archival data. The stars selected for the atlas were drawn from three populations: Galactic main sequence (class III-V) stars, supergiants, and main sequence stars in the Magellanic Clouds, which have low metallicities. For each of these stars we have prepared FITS files comprised of pairs of merged spectra for user access via the Multi-Mission Archives at Space Telescope. We chose spectra from the first population with spectral types O4, O5, O6, O7, O8, and O9.5 and used them to compile tables and figures with identifications of all possible atmospheric and ISM lines in the region 949-1188Å. Our identified line totals for these six representative spectra are 821 (500), 992 (663), 1077 (749), 1178 (847), 1359 (1001), and 1798 (1392) lines, respectively, where the numbers in parentheses are the totals of lines formed in the atmospheres, according to spectral synthesis models.

The total number of unique atmospheric identifications for the six main sequence O star template spectra is 1792, whereas the number of atmospheric lines in common to these spectra is 300. The number of identified lines decreases toward earlier types (increasing effective temperature), the while percentages of "missed" features (lines not predicted from our spectral syntheses) drops from a high of 8% at type B0.2, from our recently published B star far-UV atlas, to 1--3% for type O spectra. The percentages of overpredicted lines are similar, despite their being much higher for B star spectra. We also discuss the statistics of line populations among the various elemental ionization states. Finally, as an aid to users we list those isolated lines that can be used to determine stellar temperatures and the presence of possible chemical anomalies.

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Comments: The full set of plots and line identification tables will be available very shortly in the MAST archives at <http://archive.stsci.edu/prepds/fuvostars/> .

Email: msmith@stsci.edu