Analysis of the spectrum transition star HR 3383

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The analysis of high-resolution optical and ultraviolet (UV) spectra of the hot-Am star HR 3383 (A1Vm) is presented. Two datasets obtained with the Hubble Space Telescope have been analyzed: the spectral region from 160 to 190 nm, which was obtained with the Goddard High Resolution Spectrograph (GHRS), and the region from 212 to 288 nm, which was obtained with the Space Telescope Imaging Spectrograph (STIS). Limited optical region spectra were obtained with the Noridic Optical Telescope's SOFIN echelle spectrograph. Use of the ultraviolet spectral region is critical to determining the chemical composition of B and A type stars due to the presence of many strong transitions for heavy elements. The spectrum of HR 3383 represents a transition, or perhaps a symbiosis, of spectral peculiarities from late-B type HgMn stars and those from Am type stars. The identification of lines from certain heavy elements, for example Lu and Bi, is conducted using measurements of hyperfine structure from our laboratory data. The general nature of the atomic data for UV analysis is discussed. Nearly all lanthanide elements are identified through UV lines of their third spectrum. Element abundances are determined by fitting the observed spectra with synthetic spectra with the result of enhancements over the respective solar system values for many heavy elements, including Pt, Au, Hg and Bi, by between one and two orders of magnitude. The spectrum of HR 3383 is compared with the HST GHRS spectrum of Sirius (A1 Vm). The higher projected equatorial rotational velocity of Sirius ($v\sin i$ = 16 km s^{-1}) over that of HR 3383 ($v\sin i$ = 5.5 km s^{-1}) results in problematic line blending for abundance analyses. The element abundance distribution for HR 3383 is compared with those of HgMn stars, extending our knowledge of spectrum anomalies as a function of effective temperature.