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We extracted about 500 SWP (high-dispersion) IUE spectra of B0 to B8 stars of all luminosity classes for the purpose of creating a stellar library. Several hundred scientifically useful high-dispersion B-star spectra are in the IUE Archive. The data were taken either with the purpose of performing stellar-wind studies or investigations of interstellar absorption lines. Due to the nature of these projects, the S/N of the data is the maximum achievable with the IUE satellite. Rountree & Sonneborn (1993) and Walborn, Parker, & Nichols (1995) extracted a subset of B spectral classification standards from the IUE Archive to construct atlases of IUE high-dispersion spectra. Their work served as our guideline for the data extraction.

The data were analyzed in terms of line-profile parameters and correlations with stellar parameters were established. The goal was to create groups of mean spectra for each spectral subtype with stars Having typical stellar parameters. The spectra were rectified and cover the wavelength range 1200~\AA~---~1900~\AA. In the rectified spectra we measured:

- radial velocities of interstellar lines to determine the wavelength zero point;
- equivalent widths of interstellar lines to establish correlations with E(B-V);
- blueshifts of stellar-wind lines with respect to interstellar lines to study wind properties;
- the widths of photospheric lines to determine correlations with rotational velocity.

The complete library has been made available to the community. Previously our evolutionary synthesis code included a high-dispersion library of stellar types O and Wolf-Rayet. In this project we extended our library to types B8 for main-sequence and supergiant stars. B8V corresponds to a main-sequence mass of about 3 M and a lifetime of about 0.5~Gyr (Schaller et al. 1992). We have generated synthetic UV spectra for prototypical young stellar populations varying the IMF and the star formation law. Clear signs of age effects are seen in all models. The contribution of B stars in the UV line spectrum is clearly detected, in particular for greater ages when O stars have evolved. With the addition of the new library we are able to investigate the fraction of stellar and interstellar contributions and the variation in the spectral shapes of intense lines. We have used our models to date the spectrum of the local super-star cluster NGC 1705-1. Photospheric lines of C III ?1247, Si III ?1417, and S V ?1502 were used as diagnostics to date the burst of NGC 1705-1 at 10 Myr. Interstellar lines are clearly seen in the NGC 1705-1 spectrum. Broadening and blueshifts of several resonance lines are stronger in the galaxy spectrum than in our models and are confirmed to be intrinsic of the galaxy. Si II ?1261 and Al II ?1671 were found to be pure interstellar lines with an average blueshift of 78 km s-1 owing to a directed outflow of the interstellar medium. We have selected the star-forming galaxy 1512-cB58 as a first application of the new models to high-z galaxies. This galaxy is at z=2.723, it is gravitationally lensed, and its high signal-to-noise ratio Keck spectrum shows features typical of local starburst galaxies, such as NGC 1705-1. Models with continuous star formation were found to be more adequate for 1512-cB58 since there are spectral features typical of a composite stellar population of O and B stars. A model with Z=0.4 Zsolar and an IMF with ?=2.8 reproduces the stellar features of the 1512-cB58 spectrum.

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