

Description of the code for renormalization of ISO spectra from the Catalog of SEDs of the Late Stages Stars

The work of the code starts with plotting the SED points obtained from the [Catalog of SEDs of the Late Stages Stars](#). The code uses ISO SWS spectra from [An atlas of fully processed spectra from the SWS - AOT1](#), which are contained in "pws" files. These files present the data prior to segment-to-segment normalization, with discontinuities and overlaps, but with noise correction. The ISO SWS spectra consist of 12 segments, as detailed in the article [1] accompanying the mentioned atlas. The code splits the ISO SWS spectrum into segments and works with each one individually. A segment of the ISO SWS spectrum is approximated by a linear function. The algorithm then finds the SED points that correspond to the wavelengths within the selected segment and performs the requisite operations based on the number of appropriate points.

1. If there is more than one SED point corresponding to wavelengths within the selected segment, they are approximated by a straight line along all wavelengths within that segment. The mean value is then calculated for the plotted line. The normalization factor is defined as the ratio of the just-calculated mean value to the mean value calculated for the straight line approximating the spectrum segment.

2. If there is a single SED point corresponding to the wavelengths within the selected segment, the code plots two linear approximations, connecting this point with the nearest SED points located to the left and right of it. Sections corresponding to the wavelengths of the aforementioned spectrum segment are extracted from the plotted lines, and the mean value is calculated for these extracted sections. The normalization factor is defined as the ratio of the just-calculated mean value to the mean value calculated for the straight line approximating the spectrum segment.

3. If there are no SED points corresponding to the wavelengths within the selected segment, the two nearest points located to the left and right of the selected segment are taken as the SED points for plotting the linear approximation. A section corresponding to the wavelengths of the aforementioned spectrum segment is extracted from the plotted line, and the mean value is calculated for this extracted section. The normalization factor is defined as the ratio of the just-calculated mean value to the mean value calculated for the straight line approximating the spectrum segment.

4. If there are no SED points corresponding to the wavelengths within the selected segment, and there are no SED points located to the right or left of the selected segment, the code performs the following operations: it employs the factors describing the straight line approximating the SED in the neighboring segment (either preceding or following the selected segment) to plot a straight line extending the SED by the wavelengths of the selected segment. The mean value is then calculated for the plotted line. The normalization factor is defined as the ratio of the just-calculated mean value to the mean value calculated for the straight line approximating the spectrum segment.

After calculating the normalization factor using one of the four described methods and correcting the selected ISO spectrum segment, the algorithm sequentially performs similar operations for each following segment until the end of the spectrum.

References

- [1] Stephan D. Price G. C. Sloan, Kathleen E. Kraemer and Russell F. Shipman. [A uniform database of 2.4–45.4 micron spectra from the infrared space observatory short wavelength spectrometer](#).