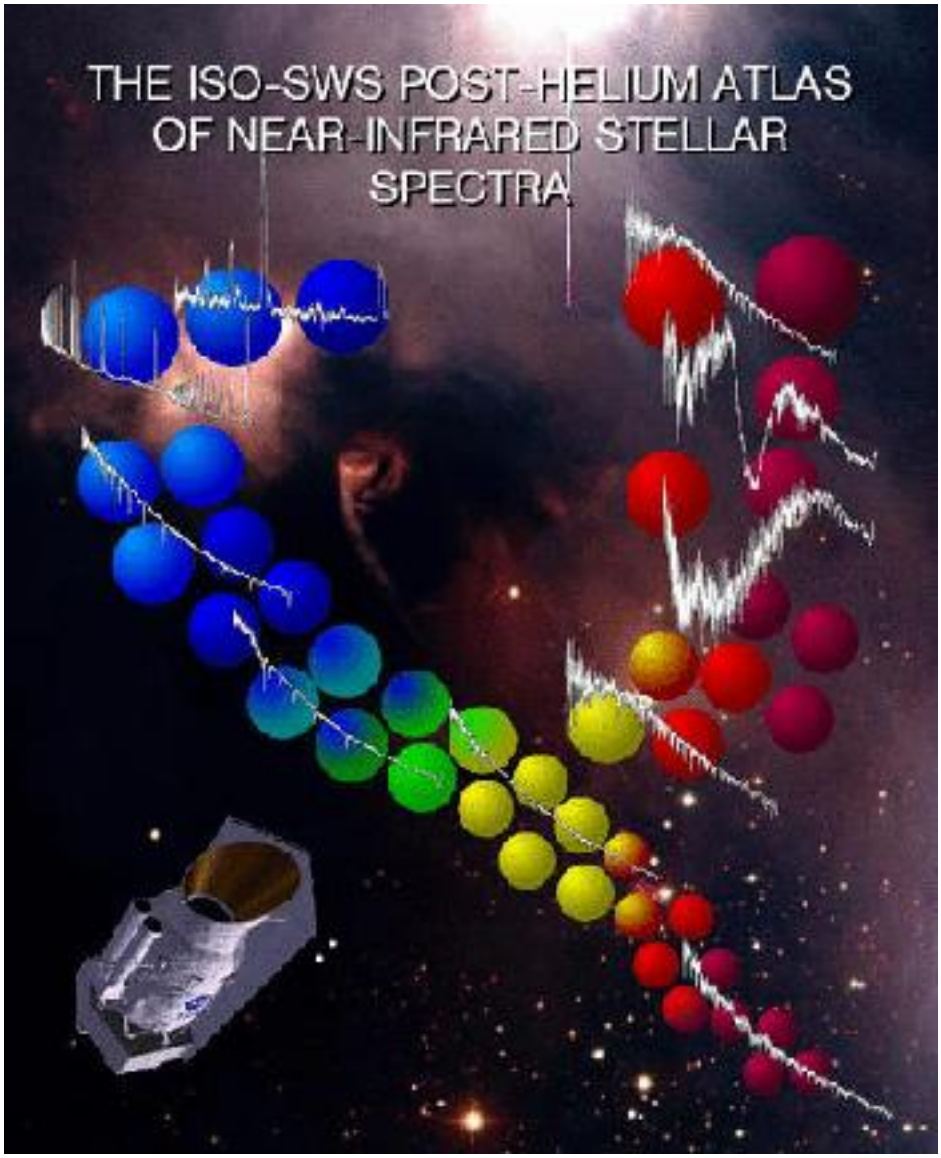

The ISO-SWS Post-Helium Atlas of Near-Infrared Stellar Spectra

B. Vandenbussche (1); D. Beintema (3); T. de Graauw (3); L. Decin (1); H. Feuchtgruber (4); A. Heras (5); D. Kester (3) F. Lahuis (3); A. Lenorzer (2); R. Lorente (6); P. Morris (7); A. Salama (6); C. Waelkens (1); L. Waters (1,2); E. Wieprecht (4)

(1) Instituut voor Sterrenkunde, K.U.Leuven, Celestijnenlaan 200B, B-3001 Leuven; (2) Sterrenkundig Instituut "Anton Pannekoek", Amsterdam, The Netherlands; (3) SRON National Institute for Space Research, Groningen, The Netherlands; (4) Max-Planck-Institut fuer Extraterrestrische Physik, Garching, Germany (5) Astrophysics Missions Division, Research and Scientific Support Department of ESA, ESTEC, P.O. Box 299, 2200 AG Noordwijk, The Netherlands (6) ISO Data Center, Astrophysics Division of ESA, Villafranca del Castillo, Spain (7) IPAC, California Institute of Technology, Pasadena, California

We present an atlas of near-infrared spectra (2.36 - 4.1 microns) of about 300 stars at moderate resolution

(1500 - 2000). The spectra were recorded using the Short-Wavelength Spectrometer aboard the Infrared Space Observatory (ISO-SWS). The bulk of the observations were performed during a dedicated observation campaign after the liquid helium depletion of the ISO satellite, the so-called post-helium programme. This programme was aimed at extending the MK-classification to the near-infrared. Therefore the programme covers a large range of spectral types and luminosity classes. The 2.36 - 4.05 micron region is a valuable spectral probe for both hot and cool stars. HI lines (Bracket, Pfund and Humphreys series), HeI and HeII lines, atomic lines and molecular lines (CO, H2O, NH, OH, SiO, HCN, C2H2, ...) are sensitive to temperature, gravity and/or the nature of the outer layers of the stellar atmosphere (outflows, hot circumstellar discs, etc...). Another objective of the programme was to construct a homogeneous dataset of near-infrared stellar spectra that can be used for population synthesis studies of galaxies. At near-infrared wavelengths these objects emit the integrated light of all stars in the system.

Atlas paper published in A&A

In this paper we present the dataset of post-helium spectra completed with observations obtained during the nominal operations of the ISO-SWS. We discuss the calibration of the SWS data obtained after the liquid Helium boil-off and the data reduction. We also give a first qualitative overview of how the spectral features in this wavelength range change with spectral type.

Vandenbussche et al. 2002 (A&A 390, 1033) (link to ADS)
Download Table1 (pdf)

The on-line Atlas

The complete Atlas containing the 293 spectra is available for download as one pdf file.

Download the full Atlas (pdf)

Principal Data Reducer

B. Vandenbussche

Date of finalisation

January 2002

Software package[s] used

SWS Interactive Analysis (SIA)

Caveats

The data reduction applied was optimised to present a continuous spectrum at the highest defensible resolution. If accurate line intensities are needed, users of the Post-Helium data should revert to line-fitting procedures of the unbinned spectra.

Data Reduction

See also Vandenbussche et al. (2002). A consistent data reduction was applied on the nominal observations in the sample (i.e. before revolution 880) and the post-helium observations in the sample (after revolution 880).

The nominal SWS observations were processed with the algorithms and calibration parameters of the Off-Line-Processing pipeline OLP10.

The changing characteristics of the SWS instrument during the Post-Helium phase required a different calibration. This is described in detail in Section 4 of Vandenbussche et al. (2002). All calibrated unbinned spectra have been reduced further in a consistent way. First a noise filter was applied. Data points that were more than 3~times the standard deviation away from the mean in a resolution bin were discarded. This process was repeated five times. The resolution bins were defined according to the average resolution per AOT-band as listed in Table 2 in Vandenbussche et al. (2002). Per AOT-band the data points were rebinned to the average resolution in the band (Table 2). In order to meet the Nyquist criterion for complete sampling of the measurement, we have oversampled four times when applying the noise filter and the rebinning.

Finally, small corrections to the absolute flux level of the four AOT-bands were applied to align them to each other. The data in the small overlap regions between the spectral bands was used to determine the scaling factors. The strategy we followed was to keep as many bands as possible fixed. The correction factors applied are small (mostly of the order of a few percent) and are listed in Table 1 in Vandenbussche et al. (2002).

File Info

The following filename convention was followed:

- swaaR*.fits files contain the unbinned spectrum.

- swma*.fits files contain the rebinned spectra as published in the Atlas.

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