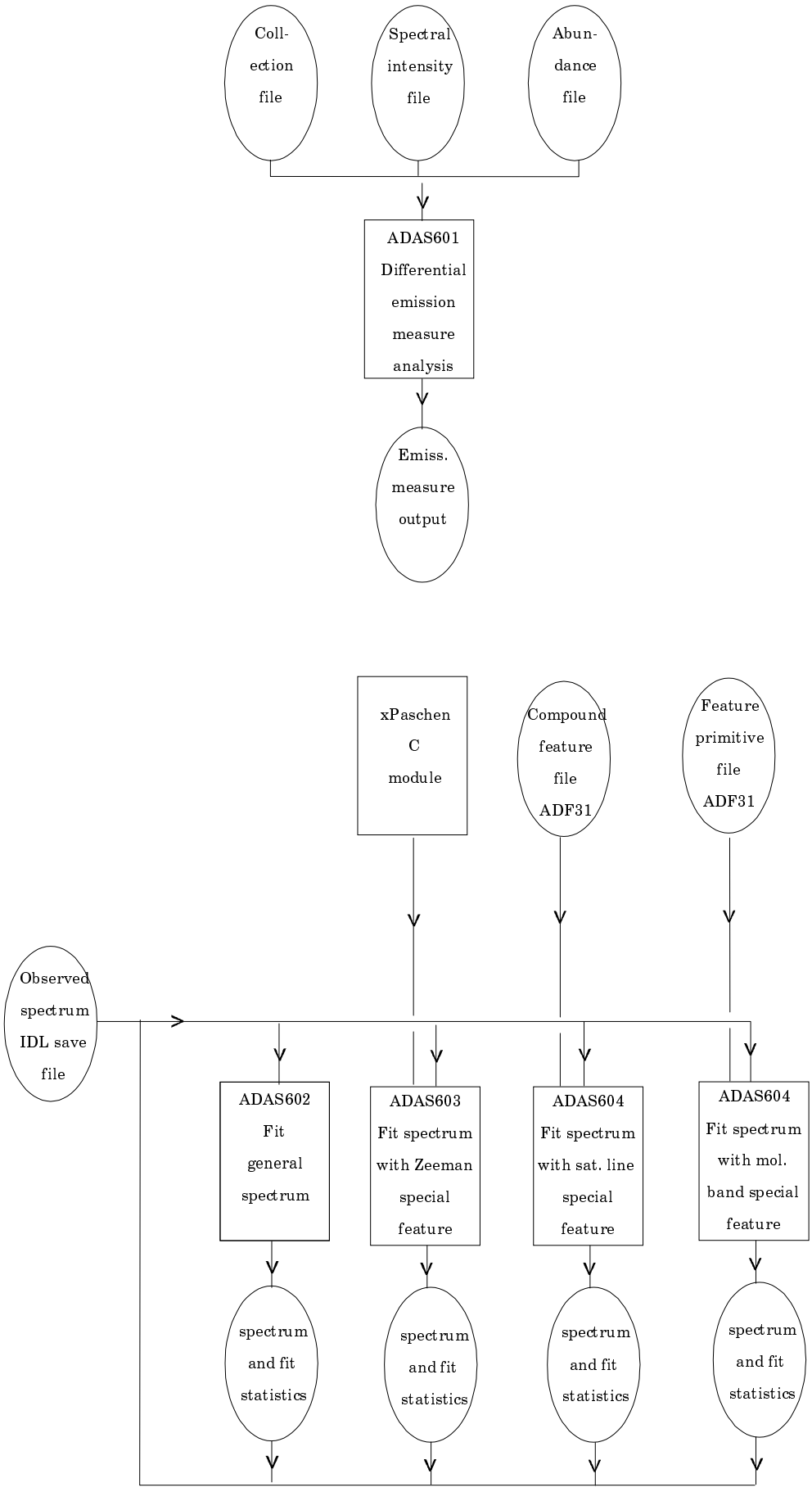
Data analysis and spectral fitting

The codes of ADAS series 6 are designed to assist in analysis of observed spectra. For intensity calibrated spectral line intensities, a standard astrophysical procedure is deduction of the differential emission measure. This form of analysis is well suited to ADAS since it requires as theoretical input a set of contribution functions or $G(T_e)$ functions. The production and archiving of such functions are provided in ADAS series 4 and 5. ADAS601 is a full implementation of the differential emission measure analysis procedure. It is the ADAS implementation of the code by Alan Thompson preferred in the Rutherfod Appleton benchmark study (Harrison & McWhirter, 1992).

The remaining codes of series 6 are for spectral fitting. The progenitor is ADAS602 which is a general purpose, Gaussian, fitting code designed. The code, set up in the first instance for reduction of the SOHO-CDS and SOHO-SUMER spectral data stream uses a maximum likelihood method and is distinguished by quite complete statistical analysis of standard errors and confidence limits of spectral widths, wavelengths, peak heights, counts and background. The code is suited to single case studies and to semi-automatic processing of many datasets.

ADAS603, ADAS604 and ADAS605 build on ADAS602 by including the capability of fitting a special feature along with unconnected lines in the spectral interval. Each codes handles a specific special feature. Thus ADAS603 treats Zeeman/Paschen-Back multiplets, ADAS604 treats satellite line groups associated with the helium-like resonance line vicinity and ADAS605 treats diatomic molecular bands and sequences of bands. Each code depends on a parametrised theoretical representation of the special feature. In the terminology of ADAS, these are feature primitives, features or compound features depending on the particular case. Other ADAS routines can create such theoretical features and these are archived in ADAS data format ADF31. The Zeeman/Paschen-Back theoretical special feature generation is due to John Hey and Manfred Korten who have kindly supplied their xPaschen C routines to act as the code of ADAS603. All these special feature codes provide the same comprehensive statistical assessment as ADAS602 but in terms of the physical parameters such as magnetic field on which the theoretical feature depends.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