HARPS - How to get the pipeline generated files (CCF, s1d, e2ds, bis, INT_GUIDE)

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The HARPS pipeline generates separate products for both HARPS fibres (labelled A and B), cross correlating the observed spectra with template stellar spectra for various spectral types.

The primary product is a rebinned, combined 1-D spectrum in FITS binary spectroscopic data format. It is accompanied by a TAR file, containing the products of the original pipeline processing, both FITS and non-FITS.

Their content can be identified from their filenames. The root file name is “HARPS.<date_obs>”, where <date_obs> is the start of the observation in the “restricted ISO8601” format. This root name is appended with:

• “_s1d_<fibre>.fits” for 1-D extracted full spectrum, wavelength calibrated, in the solar system barycentric frame (the primary file of the release is the fibre A s1d file converted to the binary table format);

• “_e2ds_<fiber>.fits” for 2-D extracted spectrum, one row per order;

• “_bis_<sptype>_<fiber>.fits” for bisector from the cross correlation computed with the <sptype> mask;

• “_ccf_<sptype>_<fiber>.fits” for cross correlation function matrix for mask for ;

• “_ccf_<sptype>_<fiber>.tbl” for cross correlation function summary table (ASCII) with extracted radial velocity per each order;

• “_INT_GUIDE.fits” for integrated guiding image from the guide camera, used to confirm the correct centering of the star on the fibre. The image is integrated over the whole length of the scientific exposure.

Where:

• <fiber> is either “A” or “B”; in science observations the A fibre is used for the object, while the B fibre is used for ThAr lamp, dark or sky exposure, depending on the observation setup.

• <sptype> is either one of “G2”, “K5” or “M2”, depending on which spectral mask was used in cross-correlation with the spectrum. The pipeline automatically selects one of the masks based on the object’s spectral type, as recorded in the “HIERARCH ESO DPR TYPE” keyword. The “G2” mask is used if the spectral type is G9 or earlier or no spectral type is recorded, the “K5” mask is used for all Kn spectral types, and the “M2” mask is used for spectral types of M0 or later.

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