Wavelength calibration of EIS spectra

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1. Introduction

This document summarizes the steps required for deriving an accurate wavelength calibration for EIS spectra.

Routine	Purpose
eis_join_windata	Join two windatas together in wavelength direction.
eis_bin_windata	Spatially bin windata in X and/or Y directions.
eis_trim_windata	Reduce the wavelength range of a windata.
eis_combine_sitstare_windata	Join two sit-and-stare windatas in time direction.
eis_shift_spec	Interpolate all spatial pixels onto common wavelength scale.
eis_fix_windata	Remove data anomalies from windata.
eis_sat_windata	Set saturated data to missing when using /refill.

2. Instrumental effects

EIS does not have a wavelength calibration lamp, nor does it have access to photospheric lines that can be used as fiducial points. In addition the spectra move on the EIS CCDs during an orbit, and so using an off-limb spectrum to fix the calibration (assuming zero velocity) and then moving to an on-disk pointing does not work.

The key instrumental effects to bear in mind are:

1. The EIS spectra move on the CCD during the 98.5 minute orbit by about $\pm$ 60 km/s.
2. The wavelength separation between the SW and LW channels varies by up to 20 mÅ.
3. The EIS slit is not parallel to the CCD Y-axis, and so the lines' centroids change with Y-position.

Update history

Version 0.1 – first version.