Overview

The dispersion solutions for COS can be found in the dispersion reference file (DISPTAB) and are defined using the equation: 

\[ \lambda = a_0 + a_1 \times \text{pix} + a_2 \times \text{pix}^2 \] (COS ISR 2010-06). In the FUV channel, the medium resolution grating dispersion solutions are linear \((a_2 = 0)\). In the NUV channel, the dispersion solutions are quadratic \((a_2 = 10^{-6} \text{ to } 10^{-8})\). For the FUV we updated both \(a_0\) and \(a_1\) for the G30M and Gr60M standard modes. However, for the NUV channel, only the zero-points of the dispersion solution needed to be updated \((a_0)\) and only for certain cemwave/stripes combinations for which accurate zero-points had not been determined during commissioning.

We used a cross-correlation technique, correlating COS data to STIS data of the same target to derive zero-points (FUV and NUV) and dispersion coefficients (FUV only). We used STIS as a reference spectrum when possible because of its higher wavelength accuracy. The absolute wavelength accuracy of the STIS detectors is \(-2 \pm 2 \text{ km/s}\) compared to the current COS wavelength accuracy of \(-10 \pm 2 \text{ km/s}\). With this effort, we aim to increase the FUV wavelength accuracy to \(-5 \pm 2 \text{ km/s}\), i.e., from one COS resolution element (6 pixels) to half a resolution element (3 pixels).

LP1 (2009 – July 2012) – 051639ml Disp.fits

- Archival data at all COS cemwaves was available.
- The LP1 DISPTAB was delivered in May 2016.
- More information for LP1 can be found in the May 2016 STAN.

LP2 (July 2012 – February 2015) – 0bn606s Disp.fits

- Archival data at most COS cemwaves was available.
- The LP2 DISPTAB was delivered in November 2016.
- More information for LP2 can be found in the November 2016 STAN.

LP3 (February 2015 – November 2017) – coming soon

- Little archival data existed at LP3.
- We crafted a special calibration program (PID 14909) which used Eps Eri and AV75.
- Allowed us to determine both the dispersion coefficients and zero-points by taking special care, with target acquisition.
- Finalizing the LP3 DISPTAB.