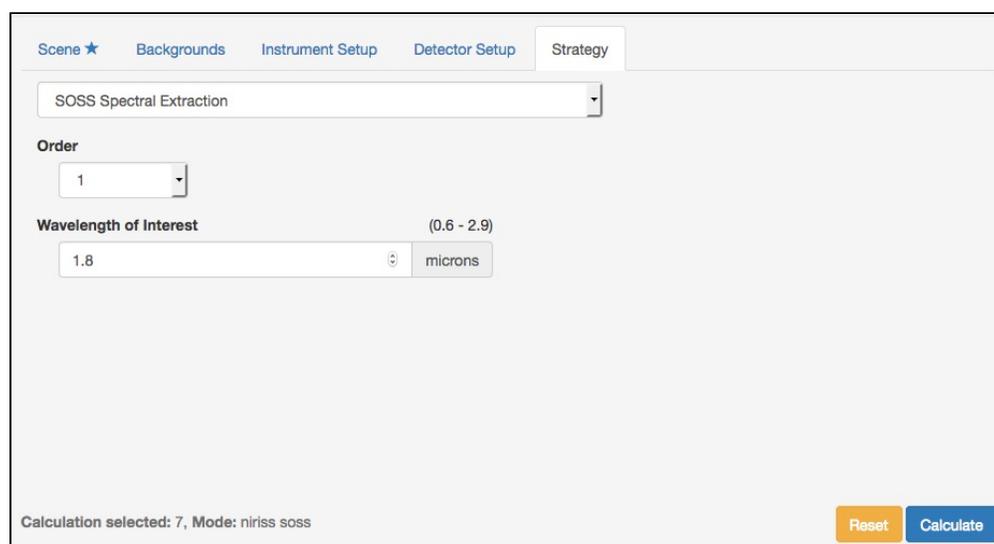# JWST ETC SOSS Spectral Extraction Strategy

The JWST Exposure Time Calculator (ETC) **SOSS Spectral Extraction** strategy is only used for the NIRISS single object slitless spectroscopy mode, and allows extraction of the signal to noise for 2 spectral orders that will be used for science observations.

NIRISS Single Object Slitless Spectroscopy (SOSS) covers the wavelength range 0.6 to 2.8 µm and has 2 spectral orders that are scientifically useful, with order 1 covering 0.9 to 2.8 µm and order 2 covering 0.6 to 1.4 µm. The *SOSS Spectral Extraction* strategy in the ETC provides an option to specify the order for which the signal-to-noise ratio should be reported (Figure 1).

SOSS offers full-frame readout and two subarray options, *SUBSTRIP256*, which samples both orders, and *SUBSTRIP96*, which captures only the 1st spectral order (an error will be returned when attempting to run a calculation with *SUBSTRIP96* and order set to 2). The wavelength range covered by the 2 spectral orders are different and the wavelength at which to report the SNR should be specified accordingly.

The readout pattern and subarray options are specified in the **Detector Setup** tab. Both *NIS* and *NISRAPID* are supported for full-frame readout, but only *NISRAPID* is supported when using either the *SUBSTRIP256* or *SUBSTRIP96* subarray. An error will be returned when selecting *NIS* readout and the *SUBSTRIP256* or *SUBSTRIP96* subarray.

Figure 1. Layout of the Strategy tab for SOSS Spectral Extraction

The extraction height of the SOSS spectrum in the cross-dispersion direction is determined by the PSF. The PSF for NIRISS SOSS is extended due to slight defocus that is built-in to allow observations of bright targets without causing saturation. The sky background is extracted for the same aperture set by the PSF, and there is no contaminating background flux in this case. The sky background is set by the options under the **Backgrounds** tab.