

WAVELENGTH CALIBRATION PROCEDURE

The GEMINI Interferometer is designed to generate a pair of phase-locked replicas of the incoming light having a variable relative delay. This delay is introduced by mechanically moving a birefringent crystal inside the interferometer by means of a motorized positioner.

Typically, with the GEMINI Interferometer, one measures the desired signal as a function of the position of the positioner (in mm), which is proportional to the delay between the two replicas. The wavelength axis is then retrieved by computing a Fourier Transform (FT) of the measured signal, which is a function of mm. The result of the FT is thus a spectrum as a function of the so-called pseudo-frequencies (in mm^{-1}). For this reason, a calibration procedure is required to retrieve the correct wavelength axis (in nm) from the pseudo-frequency axis (in mm^{-1}).

NOTE: Your GEMINI Interferometer has already been wavelength-calibrated.

However, if you are not satisfied with this calibration and want to perform the wavelength calibration again, the correct procedure is explained in detail in the following:

- Open the software “NIREOS Complete Example V.1.1” (that you can find in the USB stick).
- Open the “Initialize_parameters_cal.txt” file (that you can find in the same folder of the software “NIREOS Complete Example V.1.1”).

The “Initialize_parameters_cal.txt” file is a one-to-one correspondence between wavelength (in nm) and pseudo-frequencies (in mm^{-1}), that you can update either by adding new couples of values or modifying existing ones. In order to do that, you need to measure a spectrum with known narrowband spectral features (e.g. you can use a white light and an interferential filter) with the GEMINI Interferometer coupled to a photodetector. You can then associate wavelength of the known/tabulated spectral feature (in nm) to the correspondent pseudo-frequency read on the graph “Spectrum [mm^{-1}]” in the “NIREOS Complete Example V.1.1” and add them to the “Initialize_parameters_cal.txt” file.



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