

Helpful Hints to Extend Laser Lifetime in your MALS Instrument

Laser lifetime is related to how many hours the laser will be powered up and the power at which the laser is operated. To preserve laser lifetime, it is recommended to switch the laser off or at least reduce the laser power when not running experiments. There is no indication that switching the laser on and off will reduce laser lifetime since the solid state laser used in the instruments is intended for pulsed operation.

In your Wyatt MALS instrument, you have several options at your disposal to preserve laser lifetime:

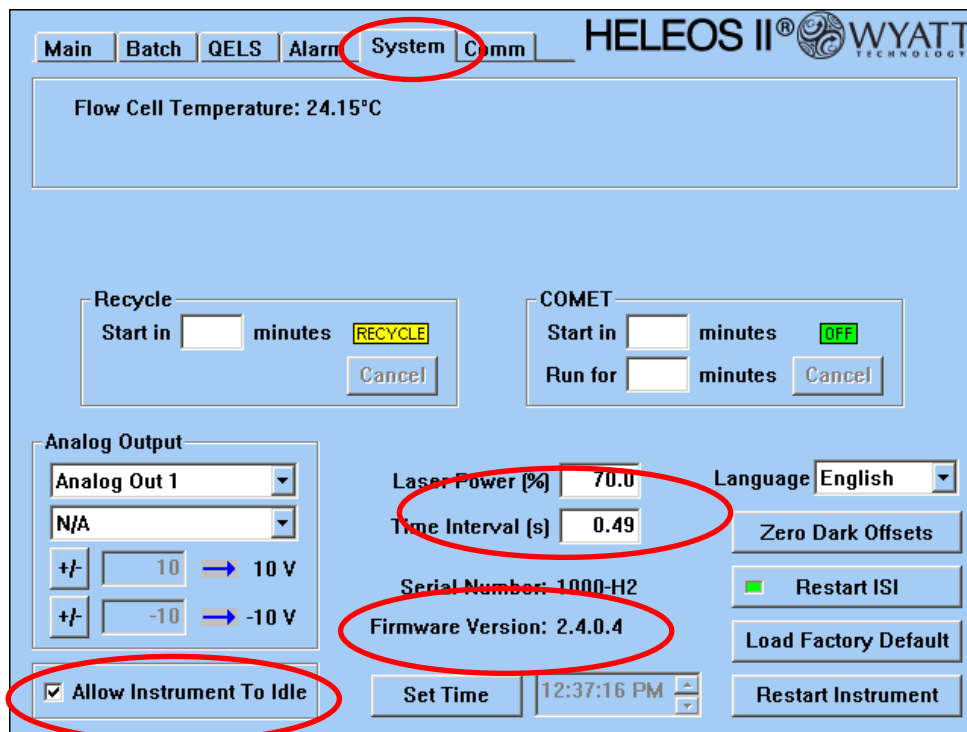
1. Install Instrument Firmware Version 2.4.x.x with “Idle Mode” for HELEOS II and TREOS Users

Install the recently released HELEOS II and TREOS Firmware version 2.4.0.4 or higher. This firmware is available for download from the Wyatt website:

HELEOS II: <http://www.wyatt.com/support/firmwareupdates/mals-firmware.html>

TREOS: <http://www.wyatt.com/support/firmwareupdates/treos-firmware.html>

In this Firmware update, an instrument “Idle Mode” feature was added that reduces laser power to 70% on the HELEOS II and TREOS instruments when they have not been in use for at least one hour. This feature is enabled by checking the “**Allow Instrument To Idle**” box on the System tab on the front panel of your instrument.



The screenshot shows the instrument's control interface with the 'System' tab selected. Key settings are highlighted with red circles: 'System' tab, 'Allow Instrument To Idle' (checked), 'Laser Power (%)' (70.0), 'Time Interval (s)' (0.49), and 'Firmware Version: 2.4.0.4'. Other visible settings include 'Flow Cell Temperature: 24.15°C', 'Recycle' (Start in minutes, RECYCLE button), 'COMET' (Start in minutes, OFF, Run for minutes, Cancel button), 'Analog Output' (Analog Out 1, N/A, +/- 10 V, +/- -10 V), 'Language' (English), 'Zero Dark Offsets', 'Restart ISI', 'Load Factory Default', 'Restart Instrument', 'Set Time', and '12:37:16 PM'.

Instrument in Idle Mode at 70% laser power

Note that the **“Allow Instrument To Idle”** box is checked as a default when installing the 2.4.0.4. (or higher) firmware. If the instrument is idling, you will see that the light scattering signals, Forward Monitor, Laser Monitor, QELS count rate (if QELS is present) and other laser associated displays will be reduced to 70% of their normal value. The “Laser” field on the Main tab will show “Idle”.

The laser power will be reset to 100% whenever the ASTRA 5 or 6 data collection is started. Similarly, for **Calypso software version 2.1.3 or higher** the laser power will be reset to 100% whenever the data collection is started. Please contact support@wyatt.com if you like help upgrading your Calypso software to version 2.1.3. Since there is no noticeable laser stabilization associated with a change in laser power, measurements can be started immediately after the instrument comes out of Idle Mode.

Important Note for Users who do NOT use ASTRA or Calypso 2.1.3 or higher software for collecting MALS Data:

If you are using a software program other than ASTRA or Calypso 2.1.3 or higher for data collection (e.g. third party software), *uncheck* the **“Allow Instrument To Idle”** box after updating the firmware, since the 2.4.x.x firmware will not recognize that the instrument is under external control and will remain at 70% power during the subsequent data collection.

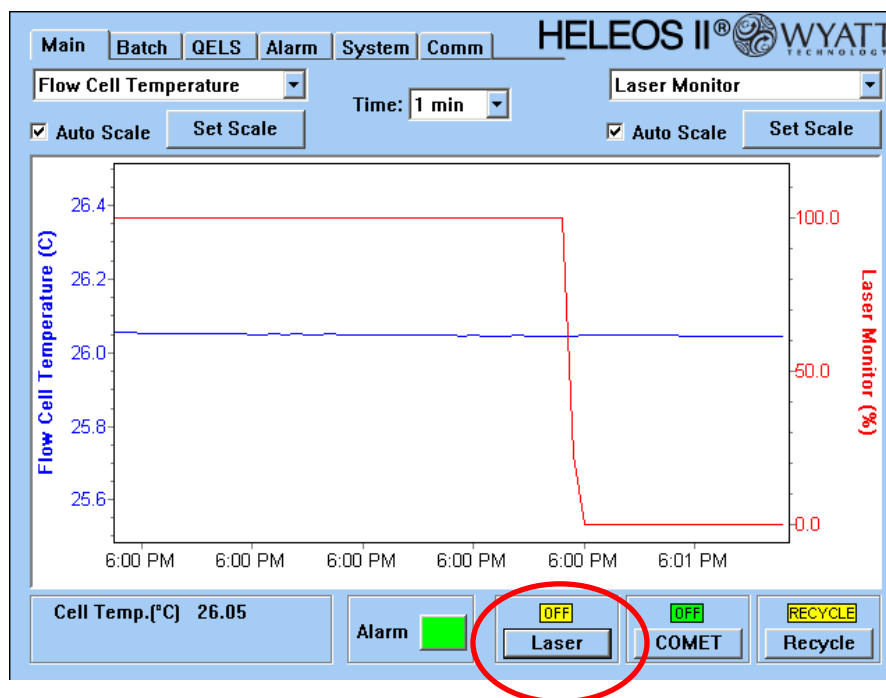
Note for HELEOS I Users:

The “Laser Idle Mode” feature does not apply to HELEOS I instruments since the laser power cannot be adjusted in the HELEOS I. For HELEOS I instruments, the following firmware updater is available.

[HELEOS I FIRMWARE UPDATE 2.3.1.4 \(5.1 MB\)](#)

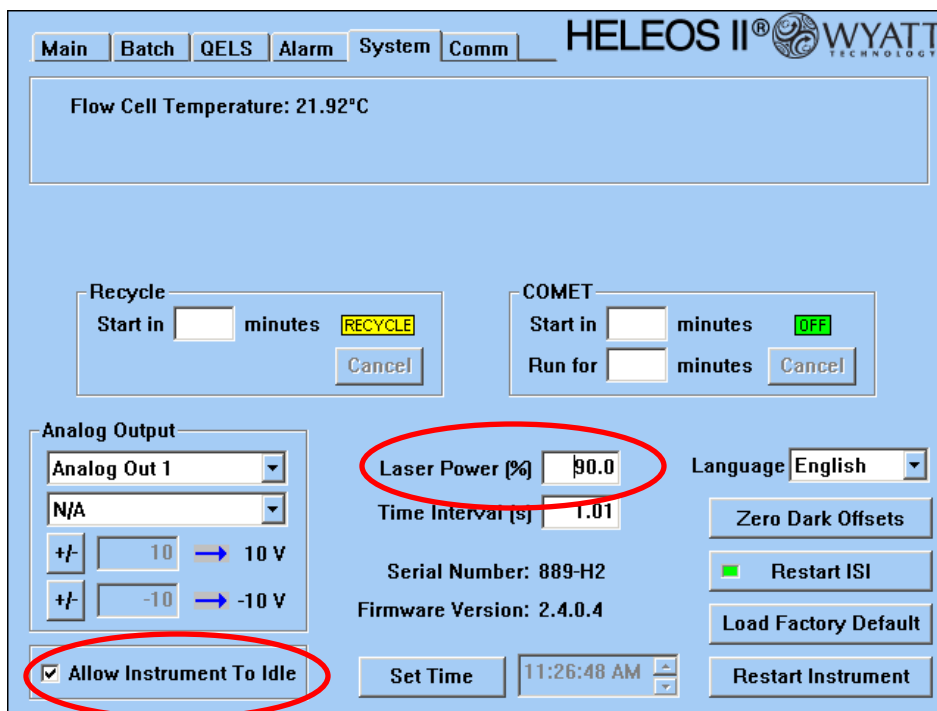
2. Turn the laser off on the front panel of your instrument (manually):

- Simply go to the **“Main”** tab on the front panel of your instrument and set the Laser to **OFF** when you are not using your instrument.



Note: It is not necessary to switch off your instrument completely. Switching off your instrument is recommended only when you are not going to use your instrument for a few days. While it takes only a few seconds for your laser to stabilize, it takes approximately 30 minutes for your MALS instrument to warm up after it is powered up.

- b) If you have a high signal-to-noise in your sample, consider running your experiments at 90% laser power. This can be set in the **Laser Power (%)** field in the **System** tab of the MALS front panel (HELEOS II and TREOS instruments only).



HELEOS II[®] WYATT TECHNOLOGY

Main Batch QELS Alarm System Comm

Flow Cell Temperature: 21.92°C

Recycle Start in minutes RECYCLE Cancel

COMET Start in minutes OFF Run for minutes Cancel

Analog Output

Analog Out 1 N/A

+/- 10 → 10 V +/- -10 → -10 V

Laser Power (%) 90.0 Time Interval (s) 1.01 Language English

Serial Number: 889-H2 Firmware Version: 2.4.0.4

Allow Instrument To Idle

Set Time 11:26:48 AM

Zero Dark Offsets Restart ISI Load Factory Default Restart Instrument

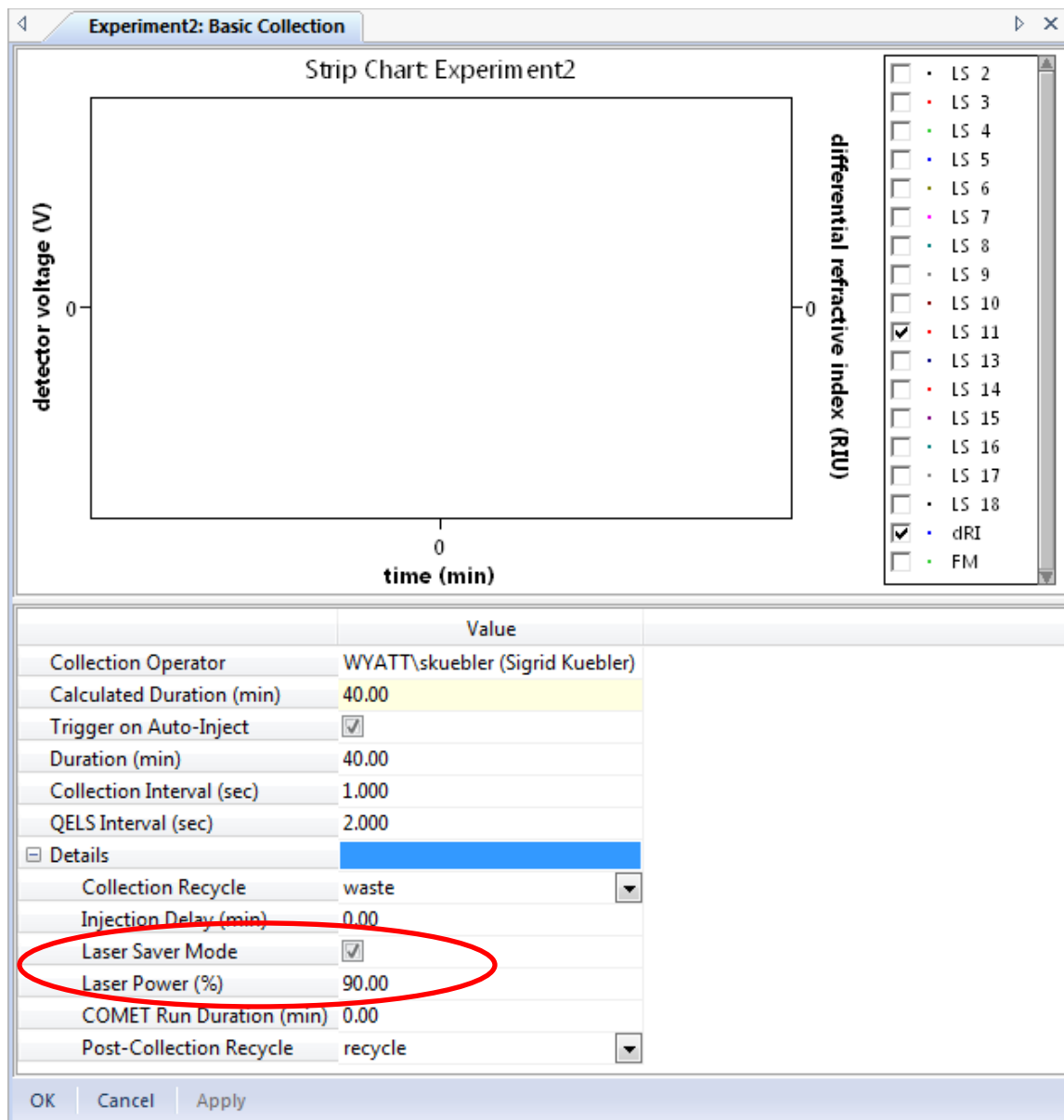
Note: Laser power is a user-definable parameter in the **Basic Collection** procedure in ASTRA 6.1.2 or later software. Please see next page for details.

3. Use the Laser Saver Mode in the ASTRA software

When running single experiments:

Check the **Laser Saver Mode** in the **Details** section in the **Basic collection** window for your experiments and methods before collecting data. This will automatically switch off the laser at the end of the run.

In ASTRA 6.1.2 and higher, you can also adjust the laser power. Note that the default laser power in ASTRA 6.1.2 is set to 90%. It can be changed by the user.

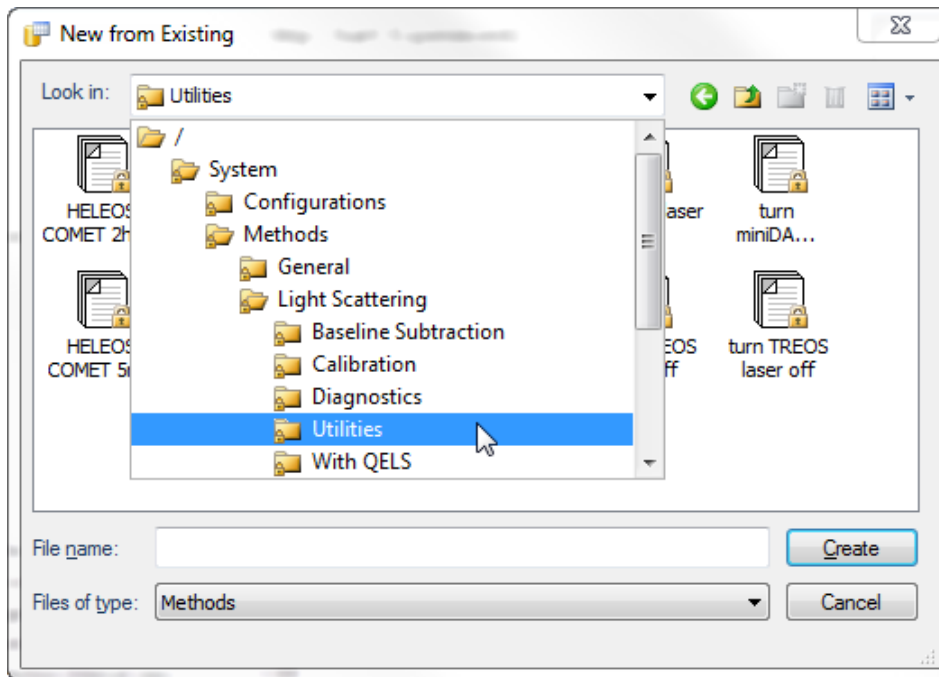


	Value
Collection Operator	WYATT\skuebler (Sigrid Kuebler)
Calculated Duration (min)	40.00
Trigger on Auto-Inject	<input checked="" type="checkbox"/>
Duration (min)	40.00
Collection Interval (sec)	1.000
QELS Interval (sec)	2.000
Details	
Collection Recycle	waste
Injection Delay (min)	0.00
Laser Saver Mode	<input checked="" type="checkbox"/>
Laser Power (%)	90.00
COMET Run Duration (min)	0.00
Post-Collection Recycle	recycle

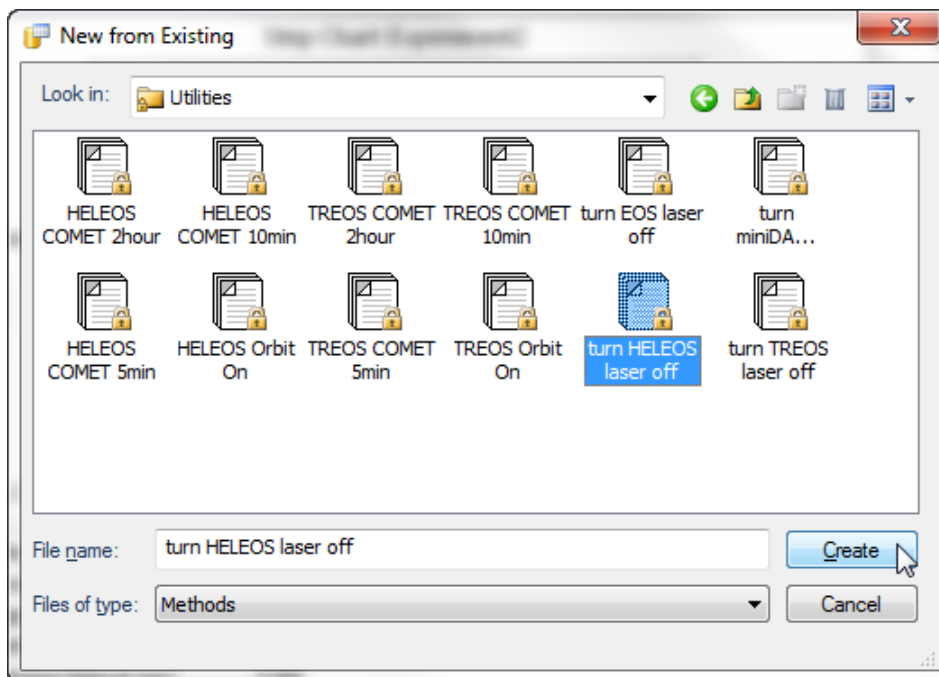
ASTRA 6.1.2 basic collection window

When running Sequences (*ASTRA 5: Templates*):

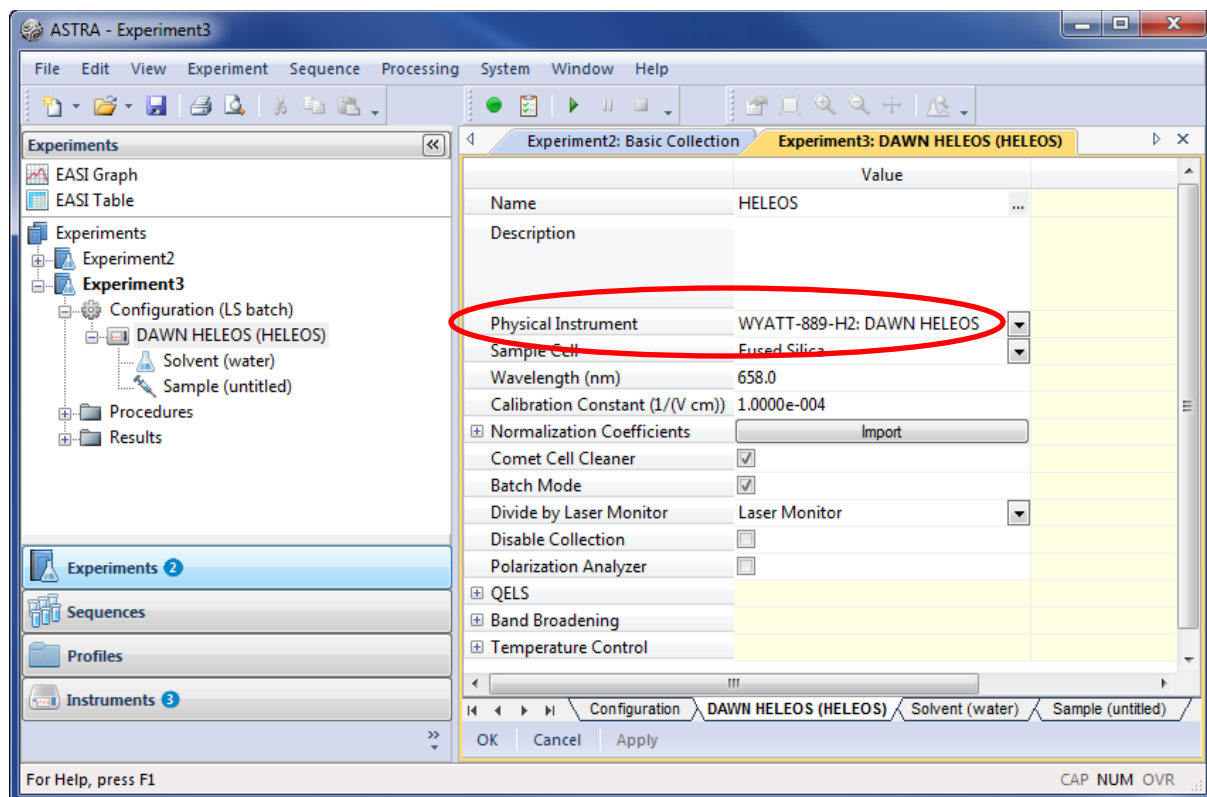
Create a "**Laser off**" method first: Go to **File** → **New** → **Experiment from Method** (*ASTRA 5: Experiment from Template*) and navigate to the **Utilities** folder in the **Light Scattering** folder.



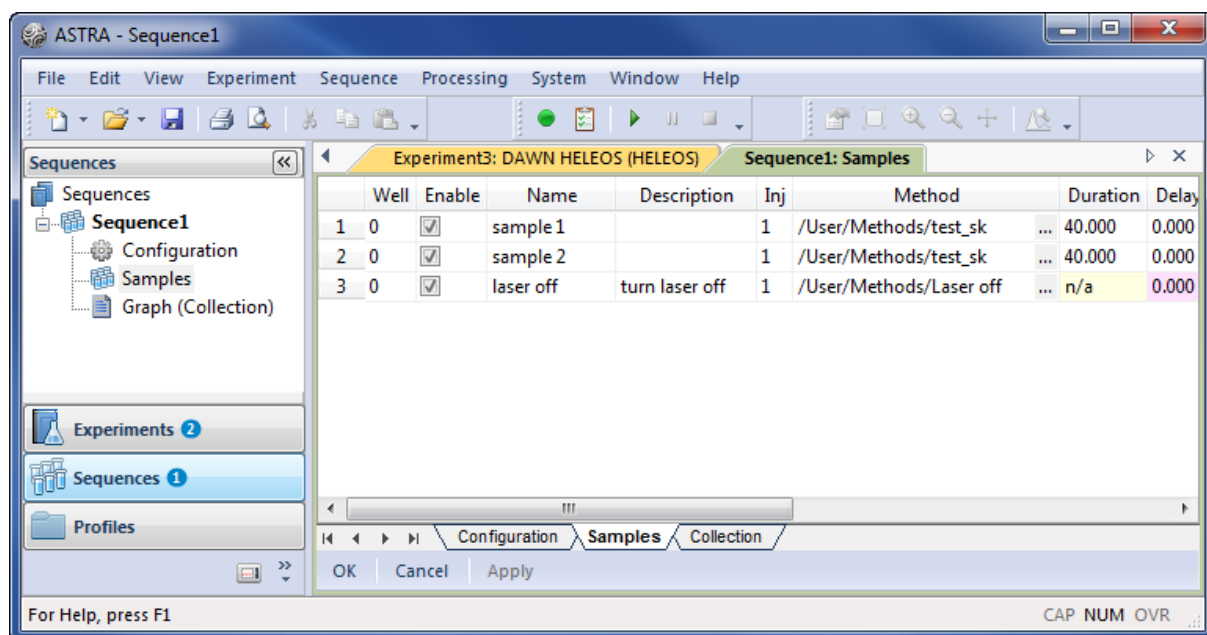
Select either "**turn HELEOS laser off**" or "**turn TREOS laser off**" and click on **Create**.



Please select your **Physical Instrument** in the method. Save this experiment as a Method (*ASTRA 5: Template*), e.g. with the file name "Laser off":



Create a new Sequence (*ASTRA 5: Sample Set*) or open an existing sequence template. Add a sample (if necessary) in the **Sample** tab by right-clicking into the table. Add your **"Laser off"** method at the end of your sample run. Make sure to click on **Apply** after you've made all desired changes to your sequence to save your updates.



4. Additional tips:

Dust will collect in your instruments intake air filter over time. It is recommended to clean the fan filter on the back of your instrument every 3-6 months or more often as needed. A clean air filter will increase air circulation and lower the temperature inside the chassis.

To clean the fan filter, pull off the plastic cover and wash the filter with soap and warm water. Pat dry with a paper towel and reinstall. Replacement filters can be ordered from Wyatt Technology (*High Porosity Fan Filter*, item number P6010-0923).

