

This guide serves just for a fast orientation. Detailed process of measurement is described in the respective software guides.

Ocean Optics JAZ + NIRQuest Fiber spectrometry setup

In Optical Lab (on/near the large vibration isolation table) you should find all components for doing transmissivity or reflectivity measurements. You must optically connect source, transmission holder or reflectivity probe (with sample) and the spectrometer. All the fibers have standardized SMA nut-bolt endings – when not used, fiber end should be protected with caps, and more importantly, light source and spectrometer exit/entry fiber ports should be capped as well.

1. Switch on the light source (the temperature stabilization is crucial especially for long measurements/mapping). The sources on the fig.



Figure 1: Left: combined halogen/deuterium source (left switch allows to select the combination); middle: UV diode (narrowband) source; right: high power halogen (VIS) source with manual intensity regulation (brass knob on the top)

2. Switch on the spectrometer

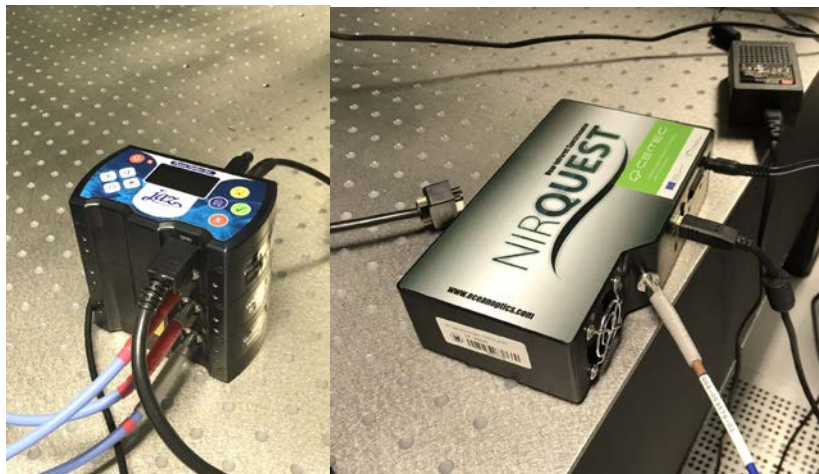


Figure 2: Left: JAZ spectrometer with the on-board processor; right: NIRQuest spectrometer

- a) JAZ3 with red button on top (check the response on display) the spectrometer has 3 channels, special triple fiber has to be used (the bottom position is for UV solarized fiber, marked with gray ending).

- b) NIRQuest is turned on by plugging in the mains; requires a stabilization of the Peltier detector cooling.
3. For *reflectivity* measurement (without mapping) you can use either top or bottom illumination (see picture): the latter has an advantage the probe/sample surface distance is constant independently of the sample thickness. The measured spot size is roughly equal to the fiber diameter (typically 200 to 800 microns).

For *transmissivity* measurement samples are placed in parallel beam created by attaching fibers to collimators with small spherical lenses: the beam diameter is about 3–4 mm. Two holders are available, one can be placed vertically (a plate for large samples is available); second (blue) one is designed also for cuvettes with liquid samples.

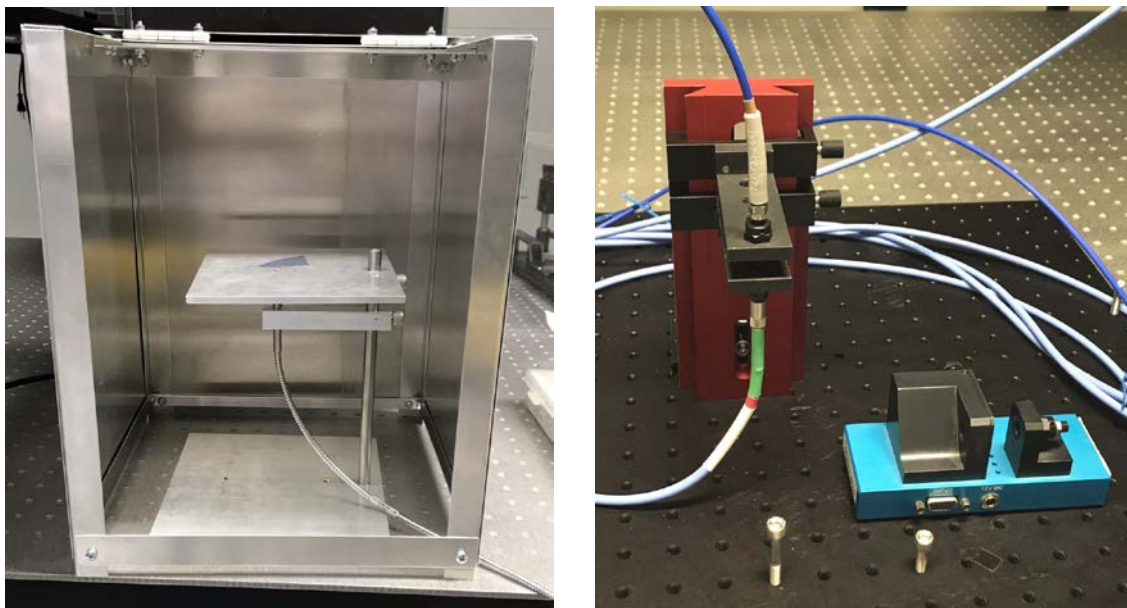


Figure 3: Left: reflectivity probe with holder (and light protection cover); right: transmission holders with collimators

Fibers (in case of single-channel measurements – not concerning bi- or tri-furcated fibers) should be chosen following the required spectral range – for UV applications *solarization resistant* (SR with reduced absorption below 400 eV) fibers are needed, but there is a gap in transmission in near IR region – for infrared measurements, different type of fibers is provided.

4. Start the software. Two options are available:
- a) **OceanView** from the manufacturer graphically oriented experimental design, possible real-time processing
 - b) **Spectrac** (homemade python GUI for original Java library): includes mapping possibility, options for scripted analysis

Operation of the software is described in separate guides.