UltraFast Innovations

YOUR KEY to innovation and success

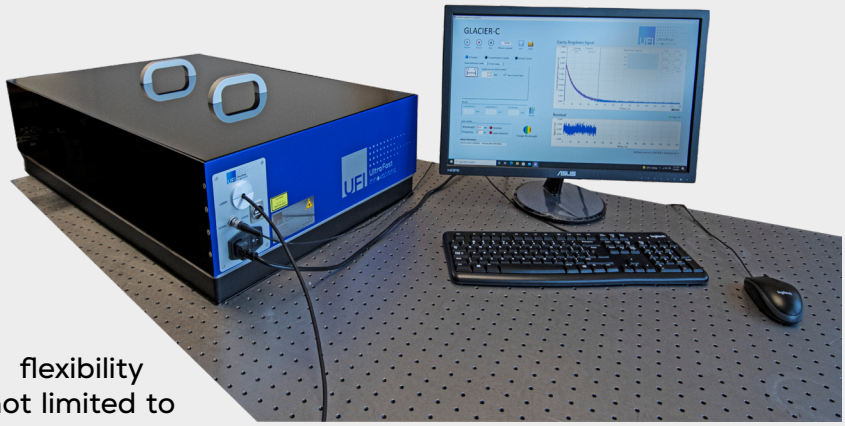
Supercontinuum light source Cavity-Ringdown Reflectometer

GLACIER®-C

Patented

GLACIER-C is a further development of our successful GLACIER reflectometer. GLACIER allows measuring the losses of optical coatings down to 5 ppm using the extremly sensitive cavity ring-down spectroscopy method. It is therefore often used to characterize highly reflective mirrors where conventional reflection and absorption measurements are insufficient.

The innovation of GLACIER-C is the employment of a super-continuum laser source in combination with a tunable monochromator. This allows a freely selectable wavelength within 450 nm and 2000 nm and, thus, offers an unprecedented flexibility as it is not limited to available diode laser wavelengths. GLACIER-C combines the unrivalled sensitivity of GLACIER with a unique wavelength flexibility, creating the most powerful device on the market. The device features high-speed data acquisition and allows to record measurements within seconds. Easy and fast change of wavelength is facilitated through the user friendly software and easy change of optics on kinematic mounts.



Key Product Features:

- **Reflectivity measurements**
  - Reflectivities up to 99.9995%
  - Various angles of incidence: 5°- 45° (and 0°)
  - s and p polarization (separately)
- **Antireflective coating characterization:** Reflectivity down to 0.0005% (5 ppm)
- **Simple and reproducible alignment** for 0.5", 1" and 2" optics
- **Spring-loaded mirror fixtures** for reproducible mounting without strain
- **Computer and user-friendly software interface included**
- **High-speed data acquisition and real-time analysis**
- **Super-continuum laser source and tunable monochromator.** Easy and fast change of wavelength
- **Freely selectable wavelength:** 450-2000 nm
- **Footprint** 90 x 55 cm²

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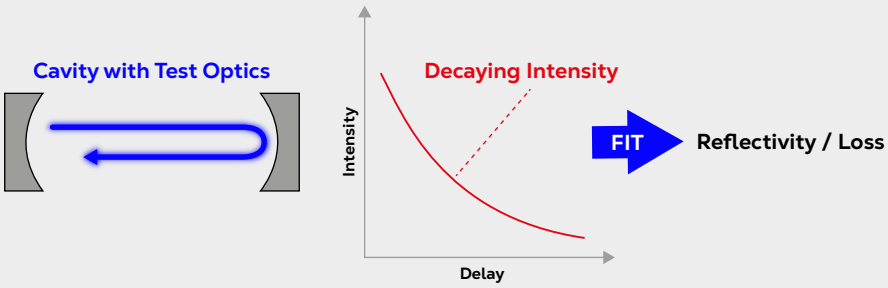
Working Principle

The principle of reflectivity/loss measurements with cavity ring-down spectroscopy is based on very low losses at each mirror bounce. The laser pulses travel inside a cavity experiencing optical losses over and over again during each round trip. The device measures the time-dependent intensity I(t) leaked through an end mirror of the cavity (center). The signal decays with a time constant depending on the intra-cavity losses.



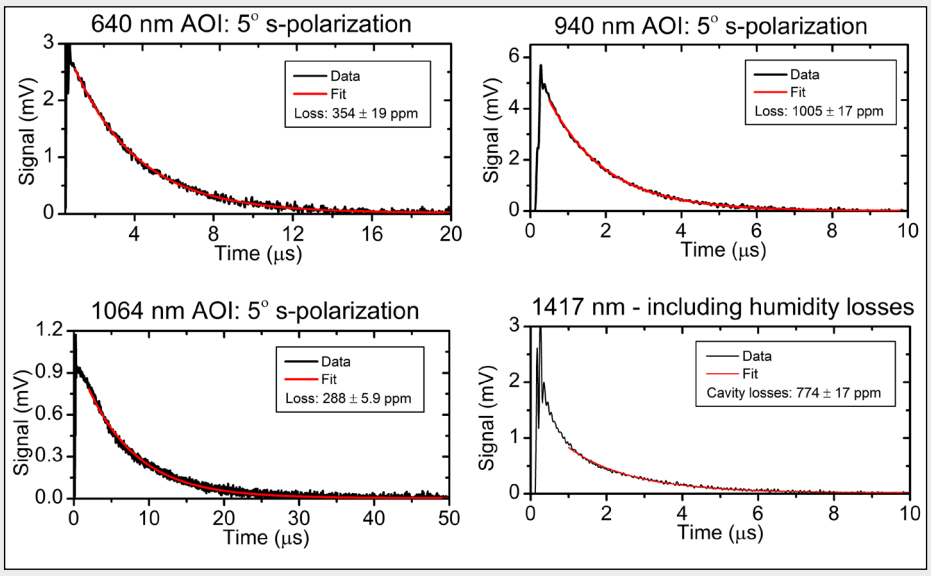
Sketch of the working principle of GLACIER, measurement and fitting procedure.

Light Source

The source consists of a super-continuum laser source and a monochromator. The monochromator is tunable as it employs Acousto Optic Tunable Filters (AOTF). The monochromator comes with two AOTF crystals, each active in separate broad wavelength ranges. The choice of crystals defines the available wavelengths and can be chosen from seven different crystals to fit individual requirements.

Example 1: 640 nm – 1100 nm & 1200 nm – 2000 nm
Example 2: 450 nm – 650 nm & 800 nm – 1400 nm

Sample Measurement



The figures show three typical measurements of high reflective samples and a measurement of an empty cavity (at 1417 nm) where humidity in the cavity causes extra losses. All measurements were recorded using the same GLACIER-C device, demonstrating its wavelength flexibility. The losses are obtained by measuring the cavity losses with and without the test sample. This provides an absolute measurement of the test sample.