

FemtoFrame-II

Transient Absorption Spectrometer



FemtoFrame-II is a UV-VIS femtosecond transient absorption pump-probe spectrometer. It is a complete turnkey system, which comes with an optical unit, auxiliary electronics and a PC containing all necessary data acquisition hardware and software. **FemtoFrame-II** is designed to work with variety of femtosecond laser sources that produce millijoule pulses at kHz repetition rate. With its broad spectral coverage from UV to NIR and the time window of up to 4 ns, FemtoFrame II produces spectral and kinetic data with excellent quality, needed for your investigations of photoinduced phenomena with femtosecond investigations time resolution.

Main Features

- > Detection of transient absorption and stimulated emission over a broad wavelength range (200-1000 nm) with sub-10 fs intrinsic temporal resolution
- > Fully computer controlled
- > Time window of 2-ns (standard) and 4 ns (-DP option)
- > Transient Absorption Anisotropy measurements
- > Dual-Beam configuration for superb signal-to-noise performance

Applications

- > Molecular spectroscopy
- > Photochemistry
- > Photophysics
- > Materials science
- > Photobiology
- > Nanoscience

Key Advantages

- > Low cost of ownership
- > Easy to use
- > Extended spectral range
- > Designed by experts in spectroscopy
- > Wide variety of alignment tools and accessories

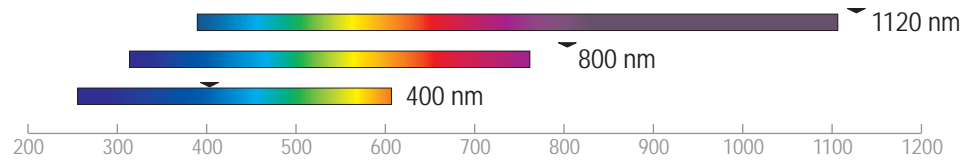
Basics of Operation

The FemtoFrame II is applied in femtosecond or picosecond pump – probe spectroscopy for sensitive measurements of photo-induced absorbance (optical density) changes. A CCD linear sensor is placed behind an imaging spectrograph to measure simultaneously the intensities for multiple wave-lengths of the probe pulses, originating from a femtosecond white light (continuum) generator.

For a given time delay between excitation and probe pulses, consecutive exposures with and without excitation are recorded, allowing to calculate the induced absorbance in the whole usable spectral range, obtaining a broad transient spectrum. The exposure conditions are highly variable by the user allowing great flexibility in matching the individual requirements of the sample.

Specifications

Probe Spectral Ranges



Spectral Resolution

Spectral resolution depends on the used monochromator. For 350-mm focal length monochromator typical spectral resolution are:

- VIS – 0.2 nm
- NIR – 0.3 nm

Time Window and Step

Standard – 2 and 3.3 ns, Step Size (Resolution) 1.33 fs
 Optional – 4 and 6.6 ns, Step Size 2.67 fs (-DP option)

Temporal Resolution:

The instrument response function is determined by the customer's laser system and has a typical FWHM of 1.5 times longer than the excitation pulse duration. The intrinsic temporal resolution is 7 fs.

Transient Absorption Anisotropy:

Yes

Probe pulse chirp

Typical temporal chirp of the probe pulse :
 500 – 800 nm: 250 fs
 320 – 750 nm: 750 fs
 (Values measured for chirp optimized alignment, not applicable to all probe alignment variations).

Dimensions

W 960 x L710 x H240 mm

Weight

56 kg (approx.)

Data Example

Basic Organic Chemistry: Ultrafast Dynamics in DDBBE

3D graph (left) and Representative transient spectra (right) of DDBBE organic dye dissolved in acetonitrile taken with FemtoFrame II. Excitation with 0.2 μ J, 1 kHz, 346 nm pulses from the doubled output of Rainbow 20F. Temporal range -0.2 ps (dark blue) to 5 ps (red).

