IB Photonics

FluoMax

Fluorescence Upconversion Spectrometer

FluoMax is a turn-key system for investigation of luorescence kinetics in solutions, solid samples and hin films. It has a time window of 2 ns with sub-100 fs intrinsic time resolution. The detection method relies on sum frequency generation in optical nonlinear crystal using femtosecond optical gating. The spectral range of **FluoMax** covers the visible and the near infrared regions. It has been designed to be matched with any type of femtosecond titanium-sapphire oscillator (1 – 100 MHz, SC version) and regenerative amplifier (0.5 – 10kHz, MP version).

Research Areas

> 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 aligment tools and accesories

Main Features

> Detection of fluorescence over a broad wavelength range (350-1300 nm)

>Sub-100 fs intrinsic temporal resolution

> Fully computer controlled

> Time window of 2-ns (standard) and 4 ns (-DP option)

> Emmision Anisotropy measurements

> Superb signal-to-noise performance

Basics of Operation

Laser induced fluorescence is produced by a femtosecond laser pulse and directed onto an optical nonlinear crystal. Sum frequency radiation is generated in the nonlinear crystal only during the time that a delayed femtosecond gate pulse is present. As a result of optical delay scanning, the fluorescence rise or decay kinetics is measured at a wavelength determined by the monochromator and the nonlinear crystal adjustments. The system sensitivity depends on the average power of the fluorescence excitation light, pulse repetition rate, emission lifetime of the sample, conversion efficiency of the spectrometer, dark count of the photon counting system, and the measurement time.

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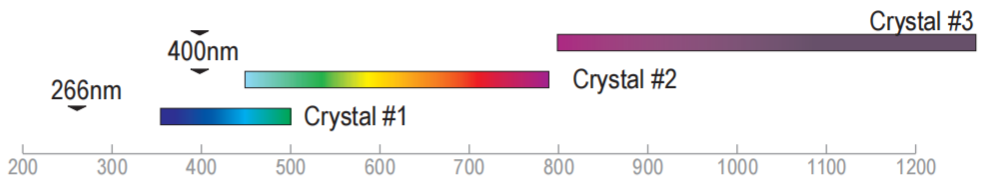
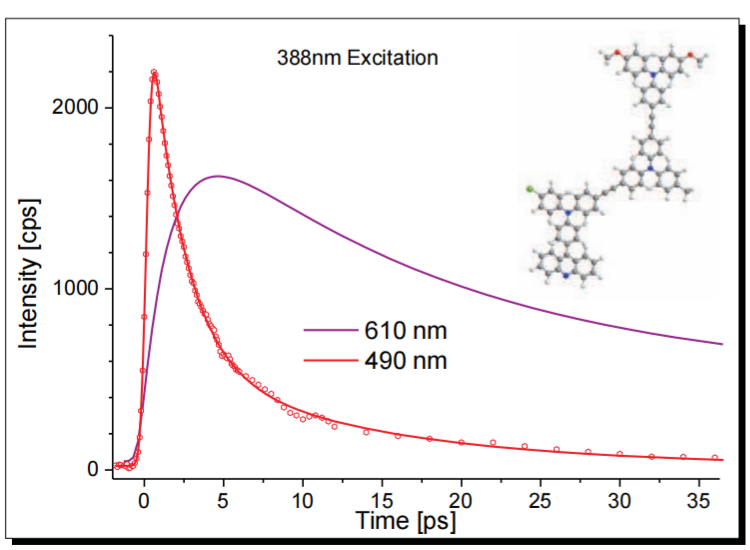
Specifications

	-SC version	-MP version
Excitation:	Embedded SHG, (external THG - optional)	Embedded SHG, (external THG or OPA)
Detection Spectral Ranges		
Spectral Resolution:	Spectral resolution depends on the used slits. Typical spectral resolution are: • VIS – 0.7 ... 8 nm • NIR – 1 ... 10 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 less than 100 fs.	
Dark Count Rate:	<30 cps (<10 cps typical)	--
Emission Anisotropy:	Yes	
Dimensions:	W 960 x L710 x H240 mm	
Weight:	56 kg (approx.)	

Data Examples

Organic Chemistry:
Charge Transfer in Syntetic Compounds

Transient emission kinetics obtained with FluoMax-MP on TAA-based organic compound in solution with excitation from Clark-MXR CPA2010™ frequency doubled output. Excitation with 2 uJ, 1kHz, 388 nm pulses. Temporal kinetic fits (solid lines) are performed with sum of exponentials convoluted with Gaussian.



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