FPPO-ps

Ultrafast OPO System

MICROTECH® instruments, inc.

Product Description:

The FPPO is a picosecond, tunable OPO suitable for Raman imaging and spectroscopy. The system is pumped by a 6ps, 1064 nm, 110 MHz fiber laser, which is converted to 532 nm by second harmonic generation. The 532 nm pulses act as the pump for the OPO, which is tunable from 720 – 1000 nm (signal) and 1150 -1800 nm (idler). Applications include:

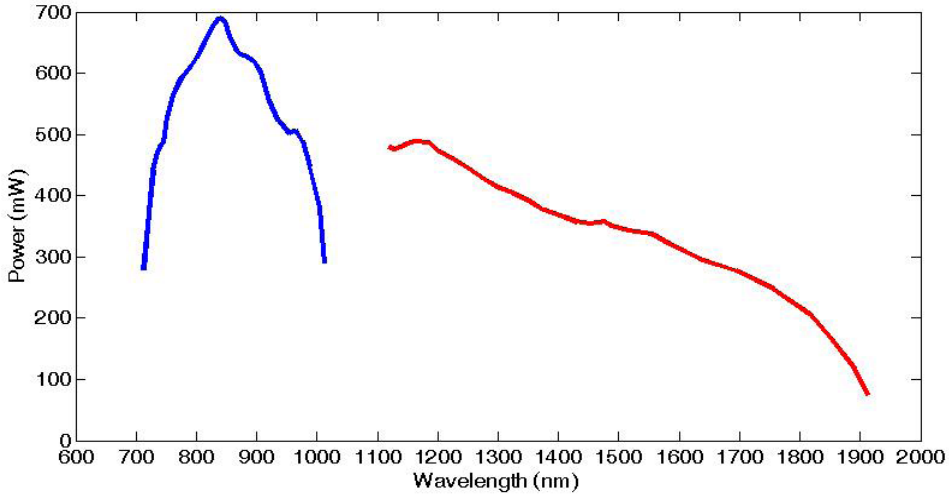
- Coherent Raman spectroscopy and microscopy
- Two color pump-probe experiments
- Multiphoton microscopy

Product Specifications:

Beam	Spectral Range	Bandwidth	Duration	Power	Rep Rate
Signal	720-1000 nm	<10 cm^{-1}	<6 ps	250-700 mW	110 MHz
Idler	1150-1800 nm	< 10 cm^{-1}	< 6 ps	100-450 mW	110 MHz
Fiber Pump	1064 nm	<10 cm^{-1}	< 6 ps	>1 W	110 MHz

Notes: **Beam Diameter:** 1 mm ; **M^2:** <1.3 ; **Polarization:** Linear, Horizontal

Product Tuning Curve:



OPO tuning curve. Signal (blue) and idler (red) power levels as a function of wavelength

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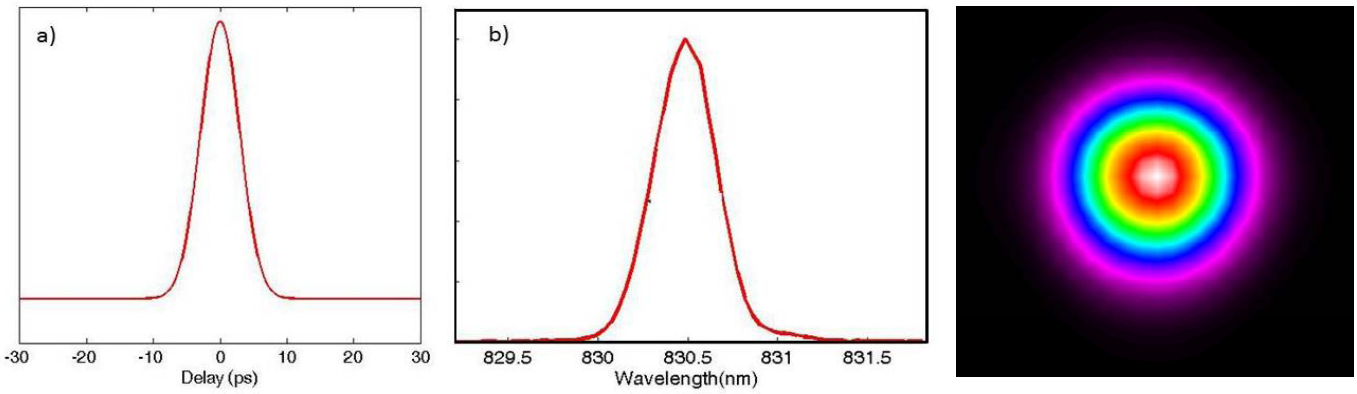
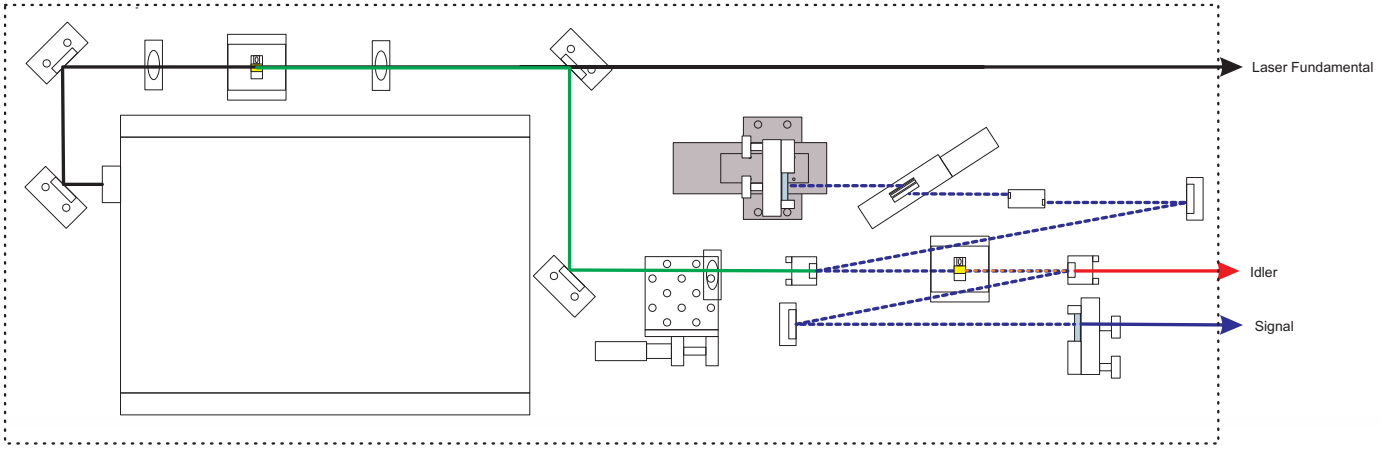
Temporal, Spectral and Spatial Properties:



Typical autocorrelation (a) and spectrum (b) for the signal of the FPPO showing a pulse duration of 5 ps and a bandwidth of 0.5 nm at a center wavelength of 830.5 nm.bandwidth of 0.5 nm at a center wavelength of 830.5 nm. On the right is the beam profile, showing a Gaussian mode with a beam diameter of 1 mm.

Product Diagram:



A fiber laser pump at 1064 nm is partially converted to 532 nm in a doubling crystal, which serves as the pump for the OPO. The OPO is resonant for the signal beam, and the idler is transmistted through a cavity mirror. The FPPO outputs consist of the signal adn idler beams as well as the undepleted pump.

In a CARS experiment, the tunable signal beam is used as the pump, while the fundamental at 1064 nm provides the Stokes pulse. The user also has access to the longer wavelength idler pulses. The short duration (< 6 ps) and narrow bandwidth (<10 cm^{-1}) provide the peak power and spectral selectivity that are necessary for CARS imaging and spectroscopy.

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