ORPHEUS

Collinear Optical Parametric Amplifier

FEATURES

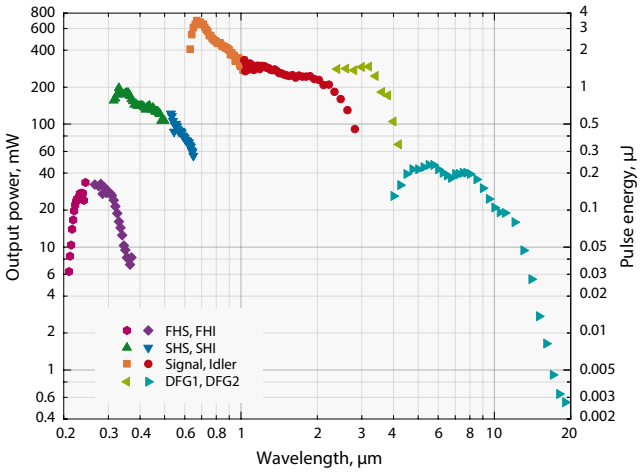
- 210 nm – 16000 nm tunable wavelength
- Single pulse – 1 MHz repetition rate
- Up to 8 W pump power
- Up to 0.4 mJ pump energy
- Computer controlled

ORPHEUS and ORPHEUS-ONE are collinear optical parametric amplifiers of white light continuum pumped by femtosecond Ytterbium based laser amplifiers. With the additional feature of being able to work at high repetition rates, ORPHEUS maintains the best properties of TOPAS series OPA's: high output pulse stability throughout the entire tuning range, high output beam quality and full computer control via USB port as well as optional frequency mixers to extend the tuning range from UV up to mid IR ranges.

ORPHEUS provides tunable OPA output (630 – 2600 nm) with residual second harmonic (515 nm) and fundamental radiation (1030 nm) beams at the same time.

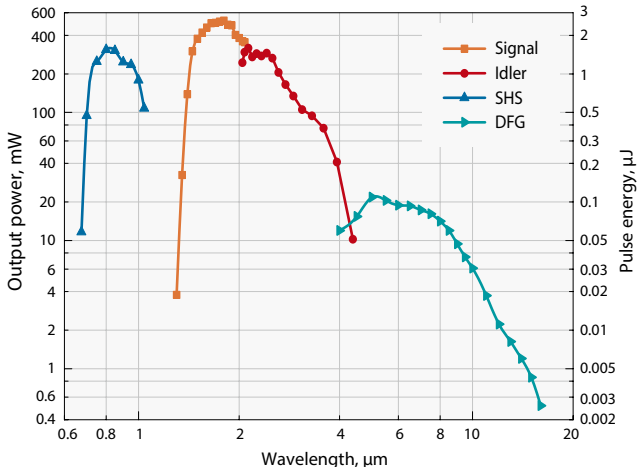
While ORPHEUS-ONE provides OPA output at (1350 – 4500 nm) Signal and Idler. The extended range 4500 – 16000 nm is accessed by mixing the signal and idler of the second stage in a mid IR crystal. In comparison to standard ORPHEUS + DFG configuration, the ORPHEUS ONE provides higher conversion efficiency into the infrared range.

Femtosecond pulses, high power tunable output together with flexible multi kilohertz repetition rate make the tandem of PHAROS and ORPHEUS an invaluable tool for multiphoton microscopy, micro structuring and spectroscopy applications. Several ORPHEUS can be pumped by single PHAROS laser providing independent beam wavelength tuning.



ORPHEUS

Typical tuning curve of ORPHEUS.
Pump: 6 W, 30 µJ, 200 kHz



ORPHEUS-ONE

Typical tuning curve of ORPHEUS-ONE.
Pump: 6 W, 30 µJ, 200 kHz

For custom tuning curve value visit *http://toolbox.lightcon.com/tools/tuningcurves/*

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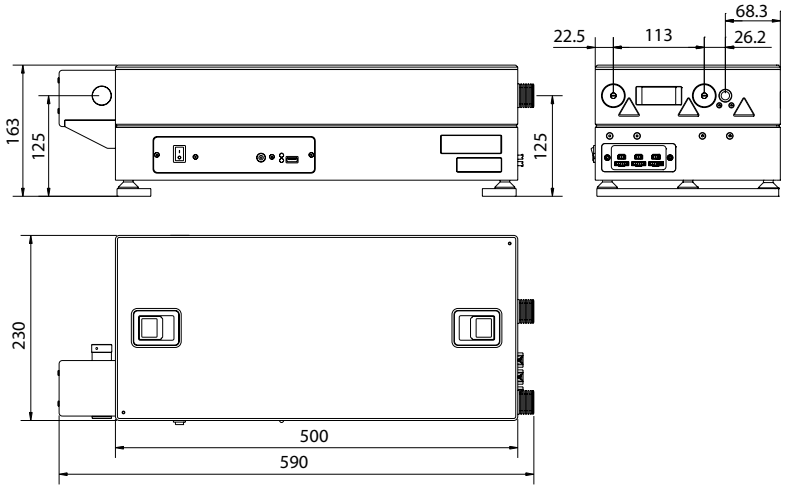
SPECIFICATIONS

Product name		ORPHEUS		ORPHEUS-ONE	
OUTPUT FROM ORPHEUS					
Tuning range	Signal	630 – 1030 nm		1350 – 2060 nm	
	Idler	1030 – 2600 nm		2060 – 4500 nm	
Integrated second harmonic generation efficiency	At designated output port	> 35 % (515 nm) portB		—	
Pump power (max)		8 W		8 W	
Conversion efficiency at peak	When pump energy	8 – 20 µJ	20 – 400 µJ	12 – 30 µJ	30 – 400 µJ
	Signal + Idler combined	> 6 %	> 12 %	> 10 %	> 14 %
Pulse duration		Pharos / Carbide	Pharos-SP	—	
		130 – 290 fs	120 – 190 fs		
Pulse bandwidth	In wavelength range	700 – 960 nm		1450 – 2000 nm	
		Pharos / Carbide	Pharos-SP	Pharos / Carbide	Pharos-SP
		80 – 150 cm^{-1}	100 – 220 cm^{-1}	60 – 120 cm^{-1}	
Long term power stability	8 hours	< 2 % @ 800 nm		< 2 % @ 1550 nm	
Pulse energy stability	1 min	< 2 % @ 800 nm		< 2 % @ 1550 nm	
OUTPUT FROM WAVELENGTH EXTENSIONS					
At peak	When pump energy	8 – 20 µJ	20 – 400 µJ	12 – 30 µJ	30 – 400 µJ
	315 – 515 nm (SH of Signal)	> 1.2 %	> 3 %	—	
	515 – 630 nm (SH of Signal)	> 1.2 %	> 3 %	—	
	720 – 970 nm (SH of Signal)	Is covered by Signal from ORPHEUS		70 – 150 cm^{-1} @ 800 – 970 nm	
				> 2 %	
	210 – 255 nm (FH of Signal)	> 0.3 %	> 0.6 %	—	
	255 – 315 nm (FH of Idler)	> 0.3 %	> 0.6 %	—	
	2200 – 4200 nm (DFG1)	3000 nm		Is covered by Signal and/or Idler from ORPHEUS-ONE	
		> 1.5 %	> 3 %		
	4000 – 16 000 nm (DFG2)	10 000 nm		60 – 150 cm^{-1} @ 5000 – 8000 nm	
				10 000 nm	
		> 0.1 %	> 0.2 %	> 0.2 %	> 0.3 %



ORPHEUS drawings

Compact layout of PHAROS pump laser in tandem with ORPHEUS on 0.5 square meter