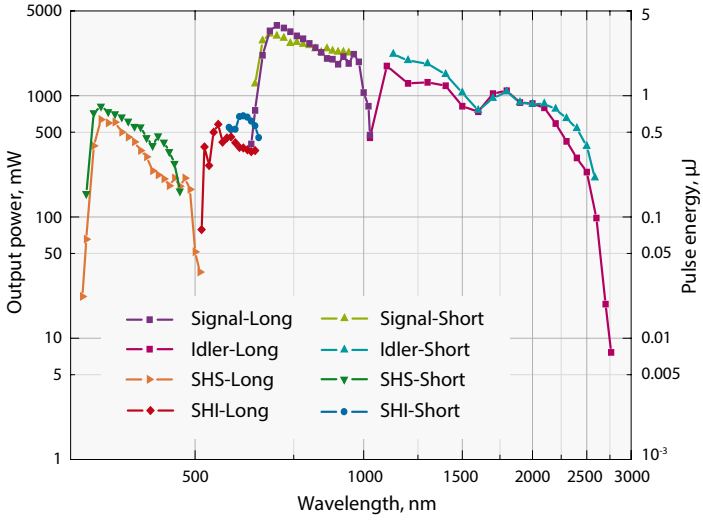
ORPHEUS-F

Broad Bandwidth Hybrid Optical Parametric Amplifier

FEATURES

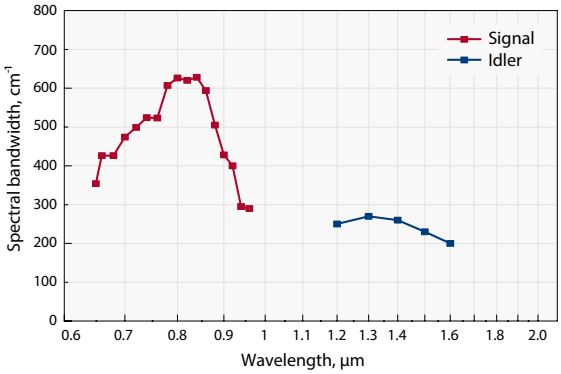
- Combines the best features of collinear and non-collinear OPA
- <100 fs pulse duration
- Variable bandwidth
- Single pulse – 1 MHz repetition rate
- Computer controlled
- Gap filling dual pulse length option

ORPHEUS-F is a hybrid optical parametric amplifier of white-light continuum pumped by femtosecond Ytterbium based laser amplifiers. This OPA combines the short pulse durations that are produced by a non-collinear OPA and wide wavelength tuning range offered by collinear version. The Signal beam can be easily compressed with a simple prism-based setup down to <60 fs in most of the tuning range, while Idler is compressed in bulk material down to 40 – 90 fs depending on wavelength. Switching to standard OPA configuration for tuning in 900 – 1200 nm range (250 fs) is optional. It possible to limit the output bandwidth to some extent (up to 2 – 3 times) without losing any output power. Standard ORPHEUS device uses spectral narrowing to produce bandwidth-limited 200 – 300 fs duration pulses directly at the output, with extended Signal/Idler tuning range and options to generate ultraviolet and mid-infrared light. Our non-collinear ORPHEUS-N-2H device produces even broader bandwidths, compressible down to <20 fs, but limits the tuning range to 650 – 900 nm. For most applications, the performance of ORPHEUS-F configuration is the optimal choice.

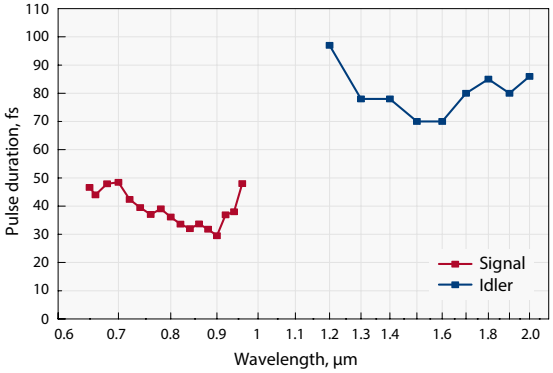


ORPHEUS-F energy conversion curve.
Pump: 40 W, 40 μJ, 1000 kHz

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



Typical spectral bandwidth of ORPHEUS-F

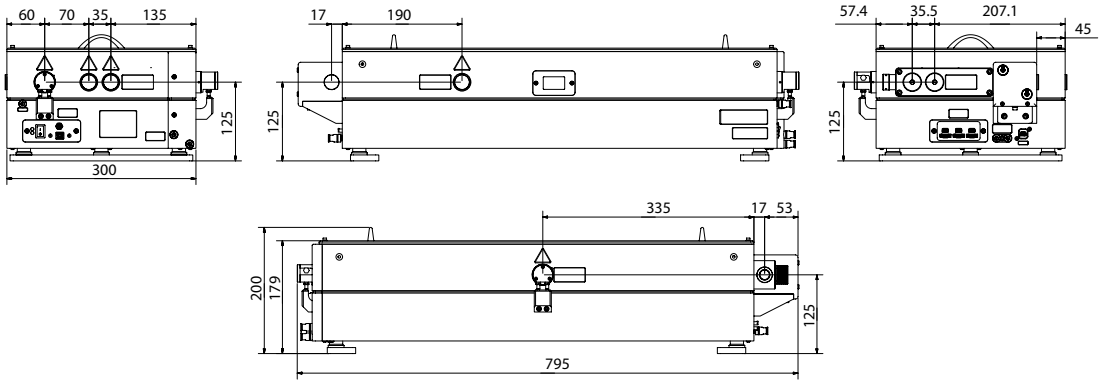


Pulse duration after compression of ORPHEUS-F

Rev. 20181219

SPECIFICATIONS

Product name		ORPHEUS-F [short pulse mode]	ORPHEUS-F [long pulse mode]	
OUTPUT FROM ORPHEUS-F				
Tuning range	Signal	650 – 900 nm	650 – 1010 nm	
	Idler	1 200 – 2 500 nm	1050 – 2500 nm	
Integrated second harmonic generation efficiency	At designated output port	> 35 % (515 nm) port G/F	> 35 % (515 nm) port G/F	
Pump power (maximum)		40 W	40 W	
Conversion efficiency at peak	When pump energy	10 – 500 µJ	10 – 500 µJ	
	Signal + Idler combined	> 10 %	> 10 %	
Pulse duration before compression		< 290 fs	< 290 fs	
Pulse bandwidth	650 – 900 nm	200 – 750 cm^{-1}	Pharos / Carbide	Pharos-SP
			80 – 150 cm^{-1}	100 – 220 cm^{-1}
Pulse duration after compressor	800 – 900 nm	< 55 fs	—	
	650 – 800 nm	< 70 fs		
	1200 – 2000 nm	< 100 fs		
	Typical: 650 – 900 nm	25 – 70 fs		
	Typical: 1200 – 2000 nm	40 – 100 fs		
Compressor transmission	650 – 900 nm	> 65 %	—	
	1200 – 2000 nm	> 80 %		
Long term power stability	8 hours	< 2 % @ 800 nm	< 2 % @ 800 nm	
Pulse energy stability	1 min	< 2 % @ 800 nm	< 2 % @ 800 nm	
OUTPUT FROM WAVELENGTH EXTENSION				
At peak	325 – 450 nm (SH of Signal)	> 1 %	—	
	325 – 505 nm (SH of Signal)	—	> 1 %	
	525 – 650 nm (SH of Idler)	—	> 0.5 %	
	600 – 700 nm (SH of Idler)	> 0.5 %	—	
	210 – 252 nm (FH of Signal)	—	> 0.1 %	
	263 – 325 nm (FH of Idler)	—	> 0.2 %	
	2200 – 4200 nm (DFG1)	Contact Light Conversion	Contact Light Conversion	
	4000 – 16 000 nm (DFG2)	Contact Light Conversion	Contact Light Conversion	



ORPHEUS-F outline drawings