ORPHEUS | OPCPA

Compact, Few-Cycle, CEP-Stable OPCPA Systems

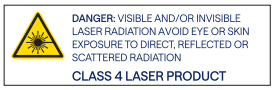
- Few-cycle pulses in a compact footprint
- Industrial-grade pump: up to 480 W, 20 mJ
- High repetition rate, up to MHz
- High-contrast variable-bandwidth seed source for CPA and OPCPA systems
- CEP stabilization option

Specifications

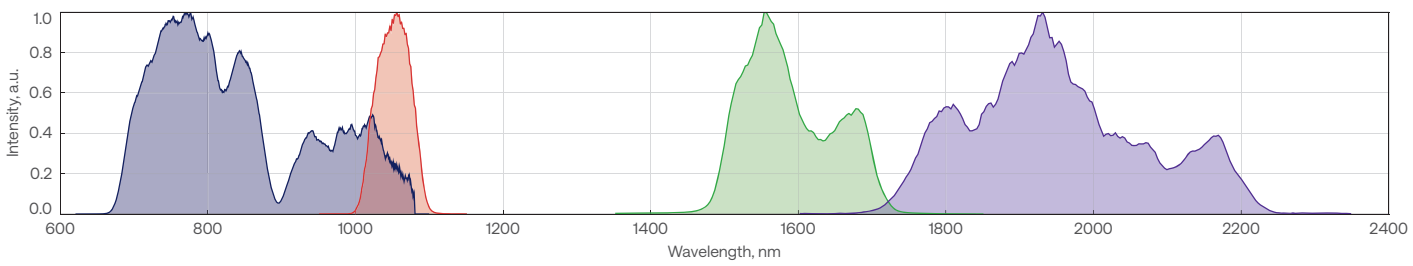
NEW

Center wavelength [1]	800 nm	1050 nm	1600 nm	2000 nm
Pump source	CARBIDE or PHAROS			
Pump power	20 – 480 W			
Pump pulse energy	0.2 – 20 mJ			
Repetition rate	1 kHz – 1 MHz			
Conversion efficiency [2]	> 7%	> 6%	> 10%	> 9%
Pulse duration [2] [3]	< 10 fs / < 15 fs	< 40 fs / < 300 fs	< 40 fs	< 25 fs
CEP stability, 1 h [2] [4]	< 250 mrad			
Temporal contrast	$\geq 10^{10}$: 1, from –500 to –50 ps $\geq 10^{9}$: 1, from –50 to –15 ps $\geq 10^{6}$: 1, from –15 to –5 ps		n/a [5]	
Long-term power stability, 8 h [2] [6]	< 1.5%			
Pulse-to-pulse energy stability, 1 min [2] [6]	< 1%			

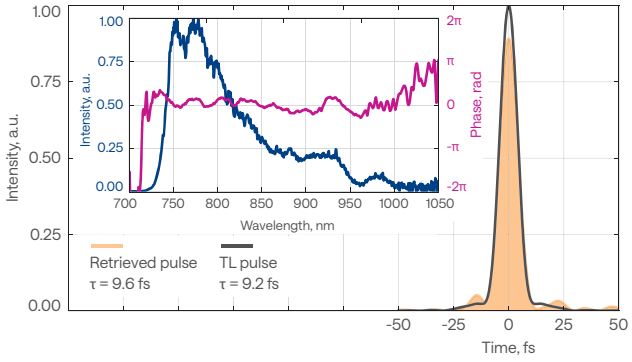
[1] *Typical wavelengths, other wavelengths are available. For custom inquiries, contact sales@lightcon.com.*
[2] *Typical values. For custom inquiries, contact sales@lightcon.com.*
[3] *Uncompressed pulses available for seeding larger amplifiers.*
[4] *CEP values calculated from unaveraged, single-shot measurements.*
[5] *Although the pulse contrast is not quantified, the identical OPA architecture is already validated at 800 nm and 1050 nm.*
[6] *Expressed as normalized root mean squared deviation (NRMSD).*



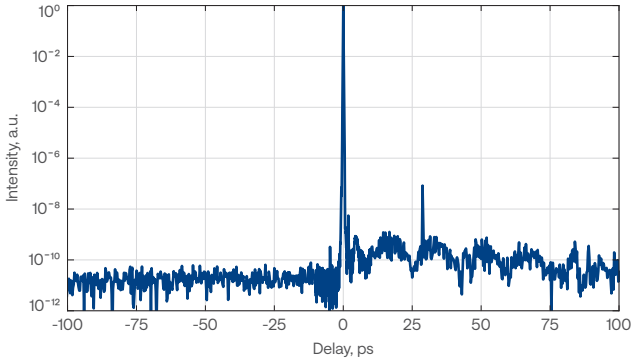
ORPHEUS-OPCPA example spectra of four models



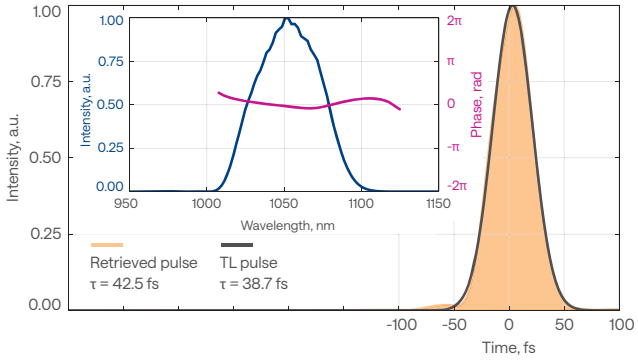
ORPHEUS-OPCPA temporal pulse profile at 800 nm



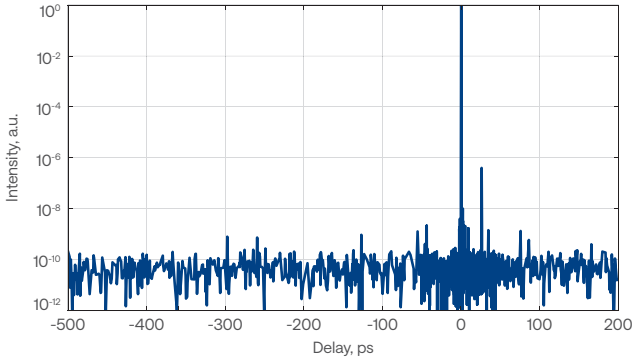
ORPHEUS-OPCPA pulse contrast measurement using a high-dynamic-range third-order autocorrelator at 800 nm



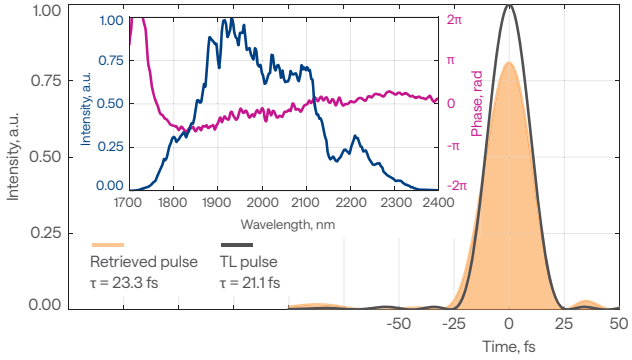
ORPHEUS-OPCPA temporal pulse profile at 1050 nm



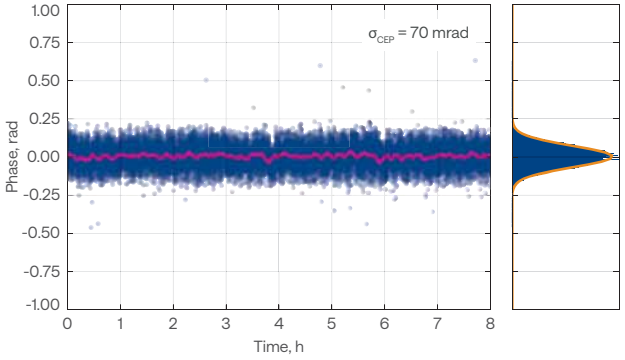
ORPHEUS-OPCPA pulse contrast measurement at 1050 nm



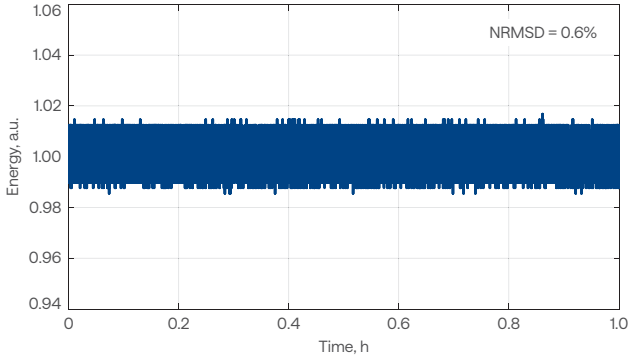
ORPHEUS-OPCPA temporal pulse profile at 2 µm



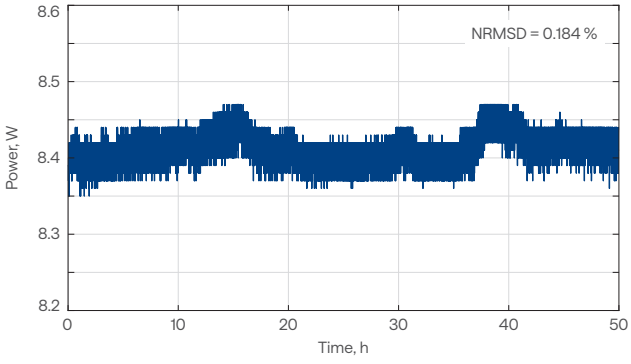
ORPHEUS-OPCPA CEP stability at 2 µm



ORPHEUS-OPCPA pulse-to-pulse energy stability at 2 µm



ORPHEUS-OPCPA long-term output stability at 2 µm



OPCPA | HE

High-Energy OPCPA Systems

- Multi-TW peak-power pulses at up to 1 kHz
- Few-cycle pulse duration and high pre-pulse contrast
- Exceptional CEP and pulse energy stability
- 800 nm, 1600 nm, 2000 nm output
- Robust design with a warm-up time of < 1 hour
- Spectral-temporal pulse shaping options

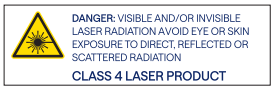
Specifications

Center wavelength	800 nm	1600 nm	2000 nm
Pump source	Picosecond Nd:YAG lasers, seeded by ORPHEUS-OPCPA		
Repetition rate	10 Hz – 1 kHz		
Maximum output pulse energy [1]	250 mJ	100 mJ	50 mJ
Pulse duration [1]	< 9 fs	< 50 fs	< 30 fs
CEP stability, 1 h [1] [2]	< 250 mrad		
Long-term power stability, 8 h [1] [3]	< 1.5%		
Pulse-to-pulse energy stability, 1 min [1] [3]	< 1.5%		

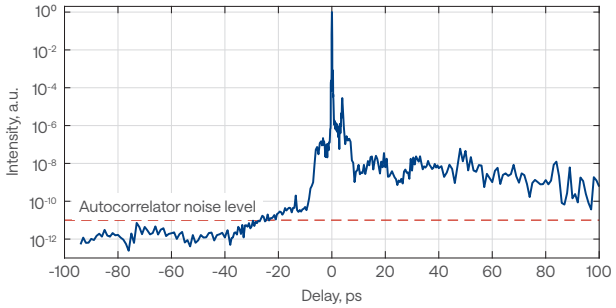
[1] *Typical values. For custom inquiries, contact sales@lightcon.com.*

[2] *CEP values calculated from unaveraged, single-shot measurements.*

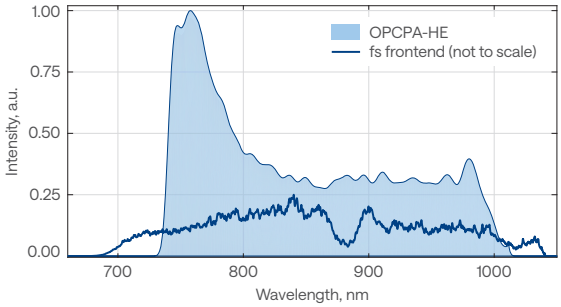
[3] *Expressed as as normalized root mean squared deviation (NRMSD).*



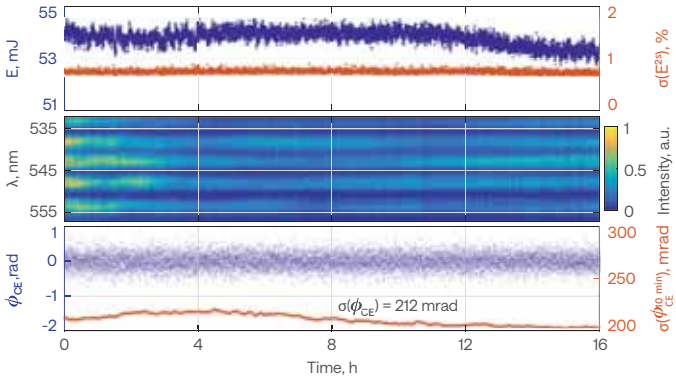
OPCPA-HE system high-dynamic-range third order autocorrelation measurement at 800 nm



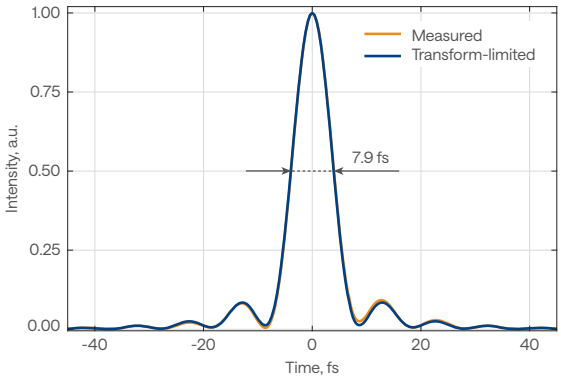
OPCPA-HE output spectrum at 800 nm



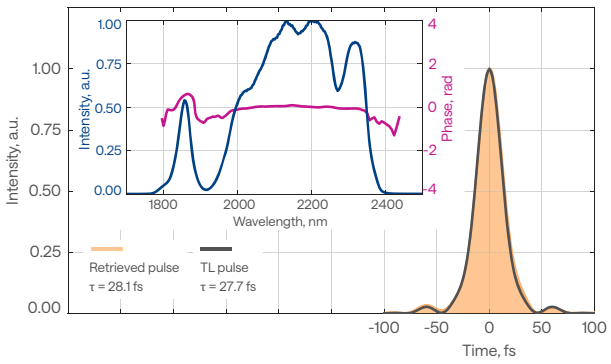
OPCPA-HE pulse energy, f-2f interferogram and CEP stability measured over 16 h at 800 nm



OPCPA-HE output pulses' temporal profile measured with a self-referenced spectral interferometry device at 800 nm



OPCPA-HE output pulses' temporal profile at 2 µm



OPCPA-HE pulse-to-pulse energy stability at 2 µm