

# ORPHEUS | OPCPA

## Compact, Few-cycle, CEP-stable OPCPA Systems

### FEATURES

- < 6 fs transform-limited pulse duration
- Up to 1 MHz repetition rate
- Up to 320 W pump power
- Up to 8 mJ pump pulse energy
- CEP stabilization option
- Compact footprint



Benefiting from the industrial-grade stability and reliability of the PHAROS and CARBIDE lasers, ORPHEUS-OPCPA delivers few-cycle, CEP-stable pulses in a package as compact as our standard parametric amplifiers. All of the ORPHEUS-OPCPA models use the same base architecture to produce CEP-stable, few-cycle pulses in one of the four center wavelengths: 800 nm, 1600 nm, 2000 nm, and 3000 nm. ORPHEUS-OPCPA is available in versions with pulse compressors for direct use in

applications or in versions intended as seed sources, delivering background-free pulses with near-single-cycle bandwidths, excellent spectral phase coherence, and CEP stability.

By using bundled CARBIDE or PHAROS lasers, pump power of up to 320 W and pump pulse energy of up to 8 mJ is accessible. The use of other pump sources for higher power, such as thin-disk or innoslab lasers, is available upon request.

### SPECIFICATIONS

Model	ORPHEUS-OPCPA			
Center wavelength	800 nm	1600 nm	2000 nm	3000 nm
Pump source <sup>1)</sup>	PHAROS / CARBIDE			
Pump power <sup>1)</sup>	20 – 320 W			
Pump pulse energy <sup>1)</sup>	0.2 – 8 mJ			
Repetition rate	1 kHz – 1 MHz			
Conversion efficiency <sup>2)</sup>	> 7%	> 10%	> 9%	> 6%
Pulse duration <sup>2)</sup>	< 10 fs	< 40 fs	< 25 fs	< 45 fs
Transform-limited pulse duration <sup>2) 3)</sup>	< 6 fs	< 30 fs	< 15 fs	< 35 fs
CEP stability, 1h <sup>2) 4)</sup>	< 250 mrad			
Long-term power stability, 8 h <sup>2) 5)</sup>	< 1.5%			
Pulse-to-pulse energy stability, 1 min <sup>2) 5)</sup>	< 1.5%			

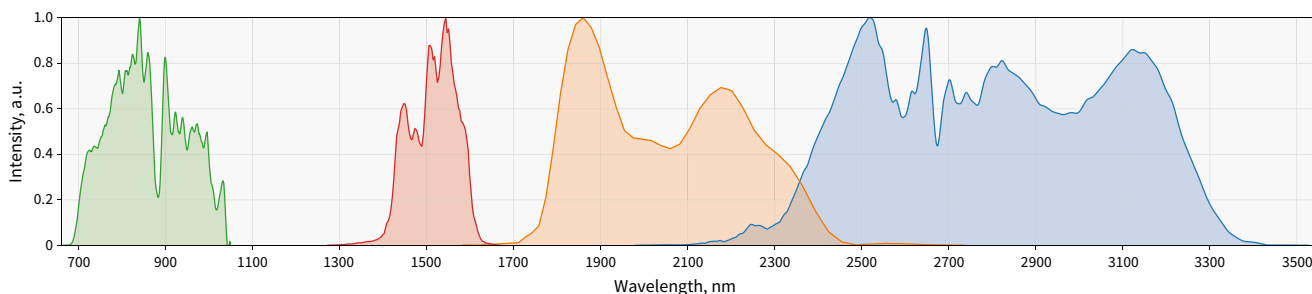
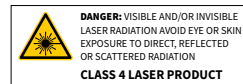
<sup>1)</sup> For using other pump sources, such as thin-disk or innoslab lasers, contact [sales@lightcon.com](mailto:sales@lightcon.com).

<sup>2)</sup> Typical values. For custom inquiries, contact [sales@lightcon.com](mailto:sales@lightcon.com).

<sup>3)</sup> Uncompressed, for seeding larger amplifiers.

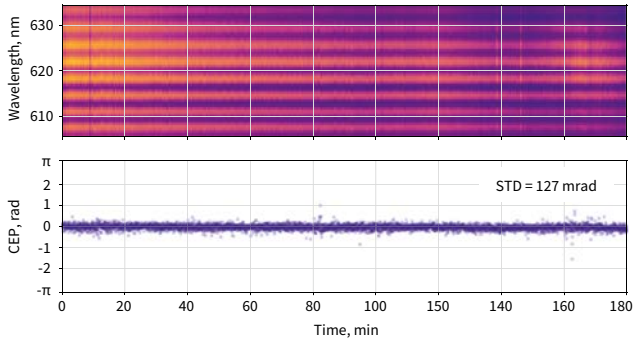
<sup>4)</sup> CEP values calculated from unaveraged, single-shot measurements.

<sup>5)</sup> Expressed as normalized root mean squared deviation (NRMSD).

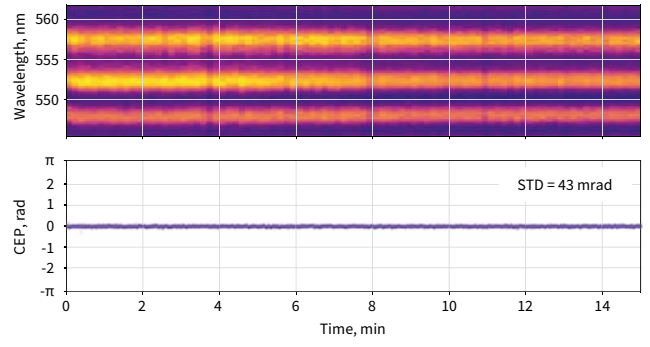


Example spectra of four models of ORPHEUS-OPCPA

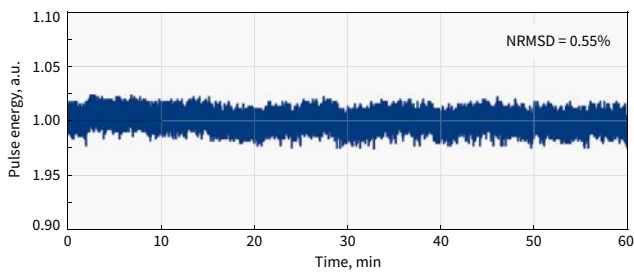
## STABILITY



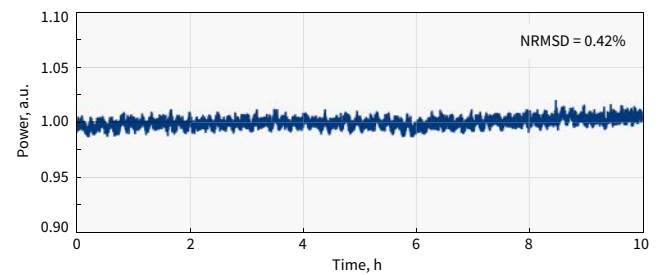
CEP stability of ORPHEUS-OPCPA (800 nm, 100 kHz)  
*All CEP values calculated from unaveraged, single-shot measurements!*



CEP stability of ORPHEUS-OPCPA (3 μm, 1 kHz)  
*All CEP values calculated from unaveraged, single-shot measurements!*



Pulse-to-pulse energy stability of ORPHEUS-OPCPA at 800 nm



Long-term output stability of ORPHEUS-OPCPA at 800 nm