

# OPCPA

## Optical Parametric Chirped-Pulse Amplification Systems

### FEATURES OVERVIEW

- Customizable light source for applications requiring the shortest pulses and extreme peak and average powers
- 800 nm – 3  $\mu\text{m}$  wavelengths, extendable to mid-IR
- Up to 5 TW peak power
- Down to 6.5 fs pulse duration
- 100 Hz – 200 kHz repetition rate
- < 250 mrad CEP stability

Optical parametric chirped-pulse amplification (OPCPA) is the only currently available laser technology simultaneously providing high peak and average power, as well as few-cycle pulse duration required by the most demanding scientific applications.

LIGHT CONVERSION's answer to these demands is a portfolio of cutting-edge OPCPA products based on years of experience in developing and manufacturing optical parametric amplifiers and femtosecond lasers.

OPCPA system delivering 5.5 TW peak power (6.6 fs, 36 mJ) pulses.

Built for ELI-ALPS in collaboration with Ekspla.



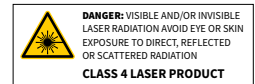
# ORPHEUS | OPCPA

## Compact Few-cycle CEP-stable OPCPA Systems Pumped by PHAROS or CARBIDE Lasers

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. The different ORPHEUS-OPCPA models all use the same base architecture to produce CEP-stable, few-cycle pulses in one of the four wavelength ranges. 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.



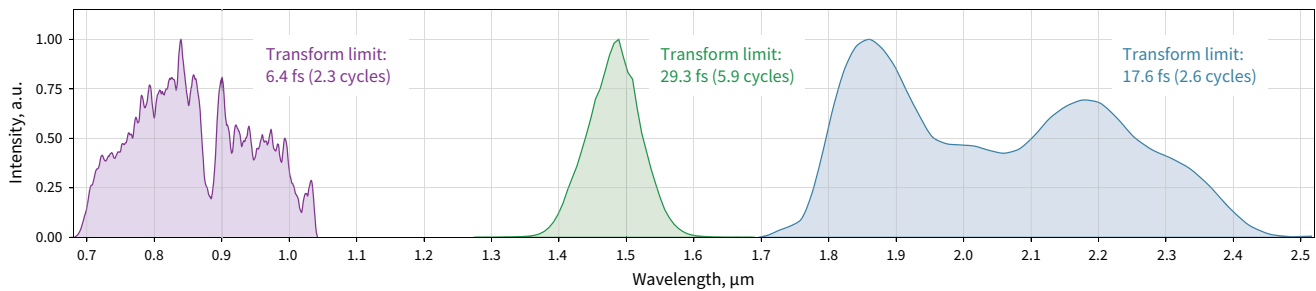
ORPHEUS-OPCPA-HR



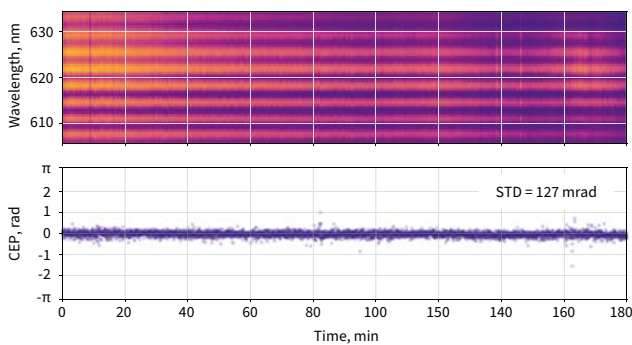
### CONFIGURATIONS

Wavelength	800 nm	1.6 $\mu\text{m}$	2 $\mu\text{m}$	3 $\mu\text{m}$
Pulse duration (compressed)	< 10 fs	< 40 fs	< 25 fs	< 45 fs
Transform-limited pulse duration (uncompressed, for seeding larger amplifiers)	< 6 fs	< 30 fs	< 15 fs	< 35 fs

	Repetition rate	Pulse energy / Output power			
<b>ORPHEUS-OPCPA</b>	10 kHz	120 $\mu\text{J}$ / 1.2 W	240 $\mu\text{J}$ / 2.4 W	180 $\mu\text{J}$ / 1.8 W	120 $\mu\text{J}$ / 1.2 W
<b>ORPHEUS-OPCPA-HE</b>		0.55 mJ / 5.5 W	1.1 mJ / 11 W	0.8 mJ / 8 W	0.5 mJ / 5 W
<b>ORPHEUS-OPCPA-HR</b>	100 kHz	25 $\mu\text{J}$ / 2.5 W	55 $\mu\text{J}$ / 5.5 W	40 $\mu\text{J}$ / 4 W	30 $\mu\text{J}$ / 3 W
<b>ORPHEUS-OPCPA-HP</b>		100 $\mu\text{J}$ / 10 W	220 $\mu\text{J}$ / 22 W	150 $\mu\text{J}$ / 15 W	120 $\mu\text{J}$ / 12 W

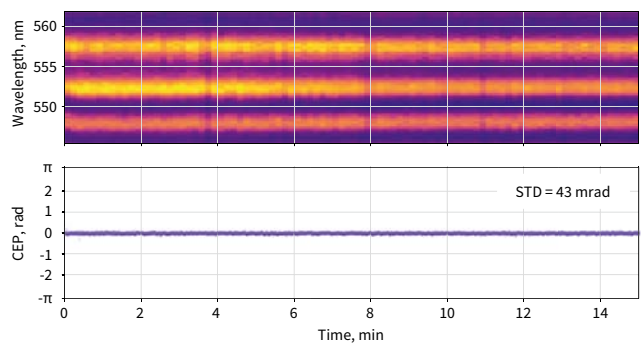


Example spectra of three models of ORPHEUS-OPCPA



CEP stability of ORPHEUS-OPCPA (800 nm, 100 kHz)

All CEP values calculated from unaveraged, single-shot measurements!



CEP stability of ORPHEUS-OPCPA (3  $\mu\text{m}$ , 1 kHz)

All CEP values calculated from unaveraged, single-shot measurements!