

## Compact, Few-Cycle, CEP-Stable OPCPA Systems



Few cycle pulses in a compact footprint

800 nm, 1600 nm, 2000 nm, or 3000 nm output

High repetition rate, up to MHz

High contrast seed source for CPA and OPCPA systems

Exceptional power, pulse energy and CEP stability

SH / TH options

### Specifications

| Center wavelength                                      | 800 nm           | 1600 nm | 2000 nm | 3000 nm |
|--|------------------|---------|---------|---------|
| Pump source <sup>1)</sup>                              | PHAROS / CARBIDE |         |         |         |
| Pump power <sup>1)</sup>                               | 20 – 480 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%           |         |         |         |

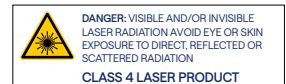
<sup>1)</sup> For using other pump sources, such as thin-disk or innoslab lasers, contact sales@lightcon.com.

<sup>2)</sup> Typical values. For custom inquiries, contact sales@lightcon.com.

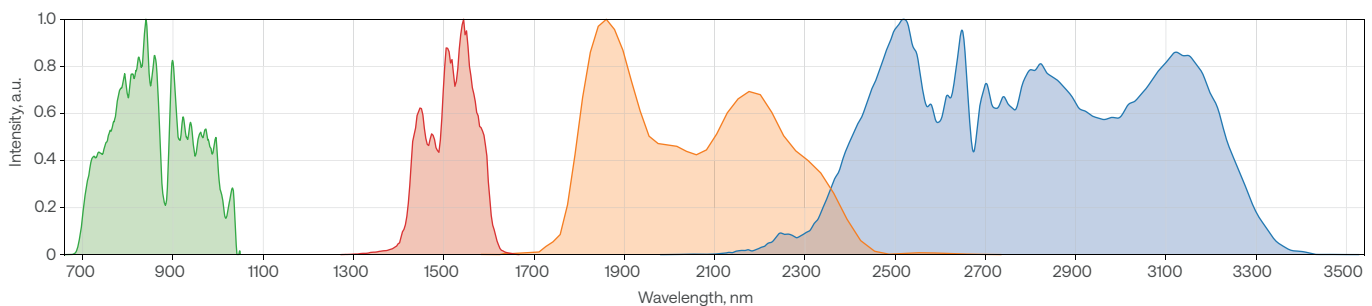
<sup>3)</sup> Uncompressed, for seeding larger amplifiers.

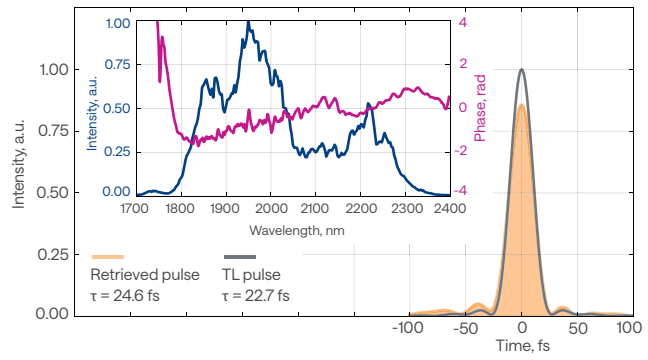
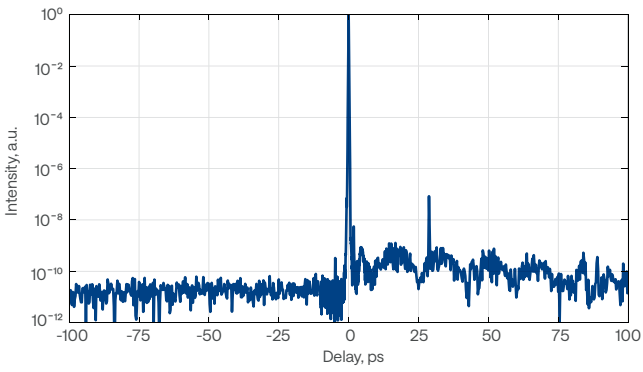
<sup>4)</sup> CEP values calculated from unaveraged, single-shot measurements.

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



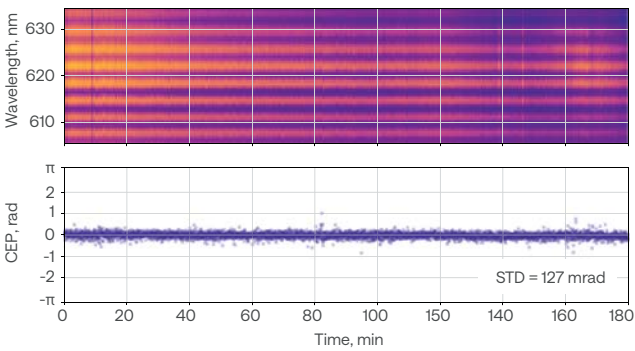
### ORPHEUS-OPCPA example spectra of four models



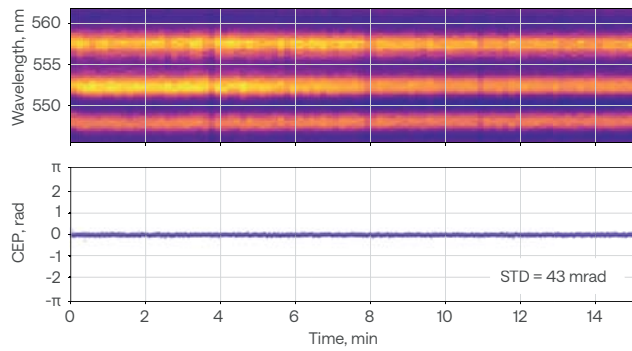


## Stability

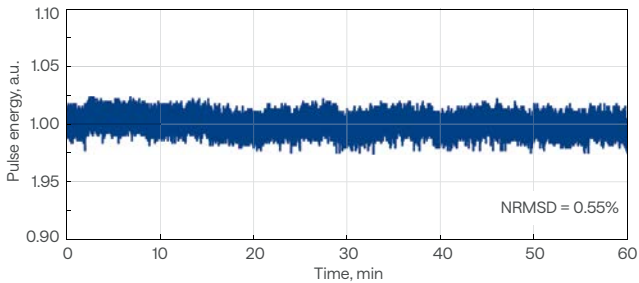
ORPHEUS-OPCPA CEP stability\* (800 nm, 100 kHz)



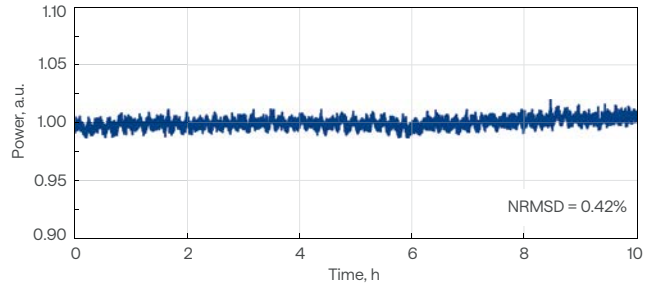
ORPHEUS-OPCPA CEP stability\* (3 μm, 1 kHz)



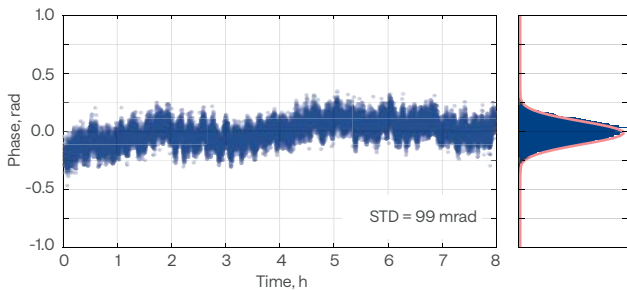
ORPHEUS-OPCPA pulse-to-pulse energy stability at 800 nm



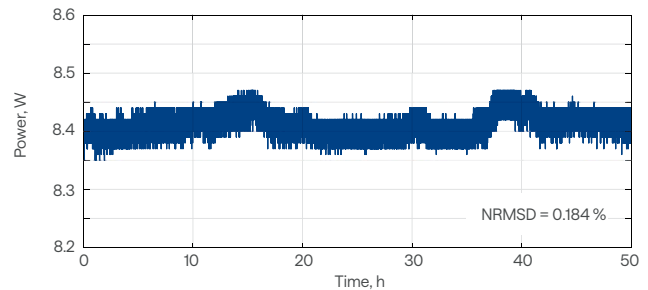
ORPHEUS-OPCPA long-term output stability at 800 nm



ORPHEUS-OPCPA CEP stability\* (2 μm, 100 kHz) without slow-loop CEP stabilization



ORPHEUS-OPCPA long-term output stability at 2 μm



\*All CEP values calculated from unaveraged, single-shot measurements.



## High-Energy OPCPA Systems

Multi-TW peak-power pulses at up to 1 kHz

800 nm, 1600 nm, or 2000 nm output

Few-cycle pulse duration and high pre-pulse contrast

Robust design with < 1 hour warm-up time

Exceptional CEP and pulse energy stability

Spectral-temporal pulse shaping options



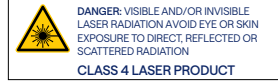
# Specifications

|  |   |         |         |
|--|---|---------|---------|
| 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 <sup>1)</sup>              | 250 mJ  | 100 mJ  | 50 mJ   |
| Pulse duration <sup>1)</sup>                           | < 9 fs  | < 50 fs | < 30 fs |
| CEP stability, 1h <sup>1)2)</sup>                      | < 250 mrad  |         |         |
| Long-term power stability, 8 h <sup>1)3)</sup>         | < 1.5%  |         |         |
| Pulse-to-pulse energy stability, 1 min <sup>1)3)</sup> | < 1.5%  |         |         |

<sup>1)</sup> Typical values. For custom inquiries, contact sales@lightcon.com.

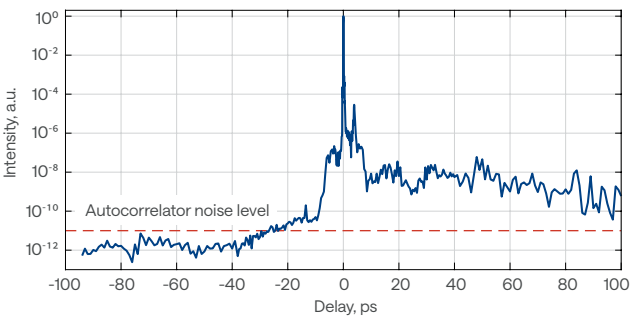
<sup>2)</sup> CEP values calculated from unaveraged, single-shot measurements.

<sup>3)</sup> Expressed as as normalized root mean squared deviation (NRMSD).

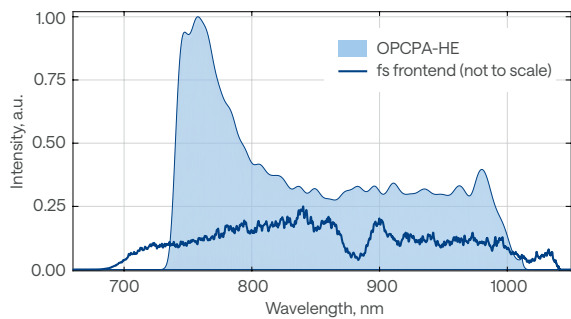


## Performance at 800 nm

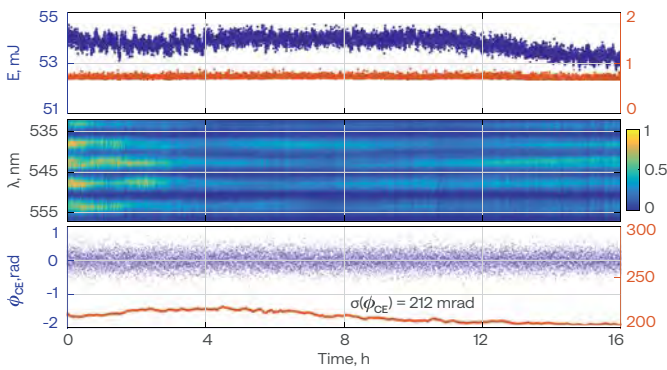
OPCPA-HE system high-dynamic-range third order autocorrelation measurement



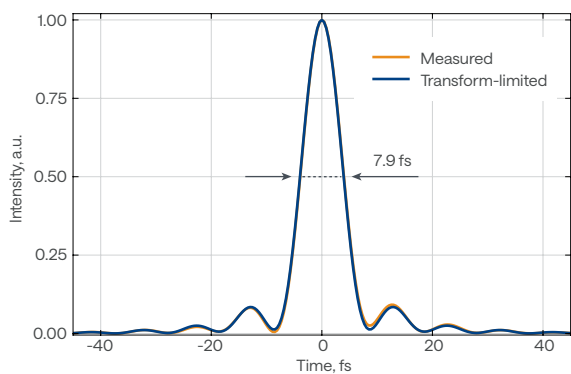
OPCPA-HE output spectrum



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

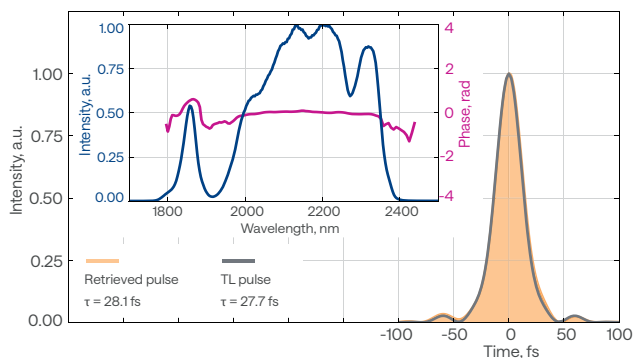


OPCPA-HE output pulses' temporal profile measured with a self-referenced spectral interferometry device



## Performance at 2000 nm

OPCPA-HE output pulses' temporal profile at 2 μm



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

