OPCPA | HE
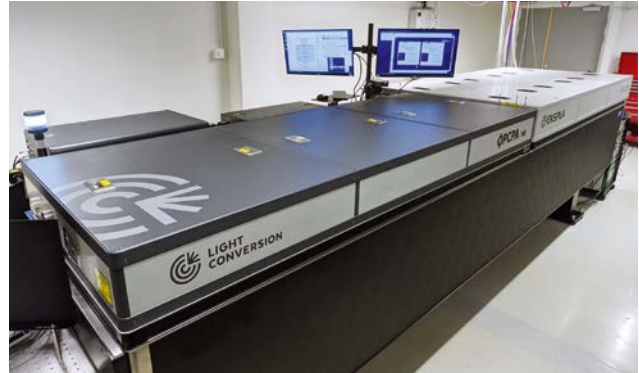
High-Energy OPCPA Systems

FEATURES

- Multi-TW peak-power pulses at up to 1 kHz
- $> 10^{12}$ pre-pulse contrast
- < 250 mrad CEP stability
- < 1.5% pulse energy stability
- < 9 fs pulse duration
- < 1-hour warm-up time
- Spectral–temporal output pulse shaping options

Applications like high-energy attosecond pulse generation, generation of high harmonics from solid targets, and laser electron acceleration all benefit from few-cycle pulse durations and excellent pulse contrast while requiring multi-millijoule pulse energy. Our most powerful high energy OPCPA systems are scalable to multi-TW peak powers at kHz repetition rates while maintaining few-cycle pulse durations. Thus, they fit the most demanding requirements while providing stability and reliability unprecedented for systems of this scale.

Furthermore, $> 10^{12}$ pre-pulse contrast is obtained without complex and lossy nonlinear pulse cleaning techniques, while < 250 mrad CEP stability and < 1.5% pulse energy stability are maintained throughout a full day of operation, making it a robust and reliable multi-TW system.
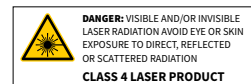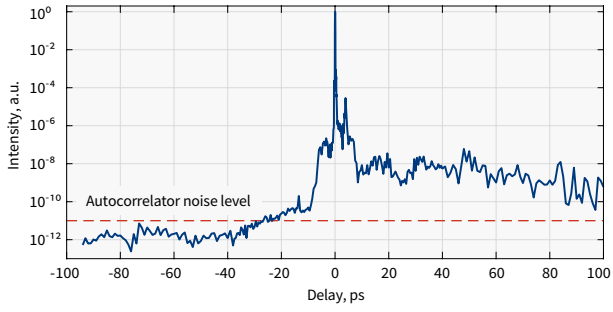
SPECIFICATIONS

Model	OPCPA-HE		
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]	120 mJ	100 mJ	50 mJ
Pulse duration [1]	< 9 fs	< 50 fs	< 30 fs
CEP stability, 1h [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%		

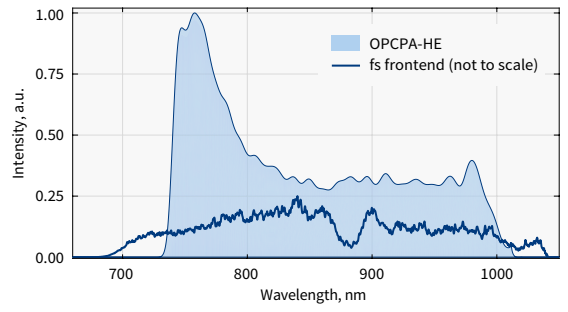[1] Typical values. For custom inquiries, contact sales@lightcon.com.
[2] CEP values calculated from unaveraged, single-shot measurements.
[3] Expressed as as normalized root mean squared deviation (NRMSD).

DANGER: VISIBLE AND/OR INVISIBLE LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT, REFLECTED OR SCATTERED RADIATION
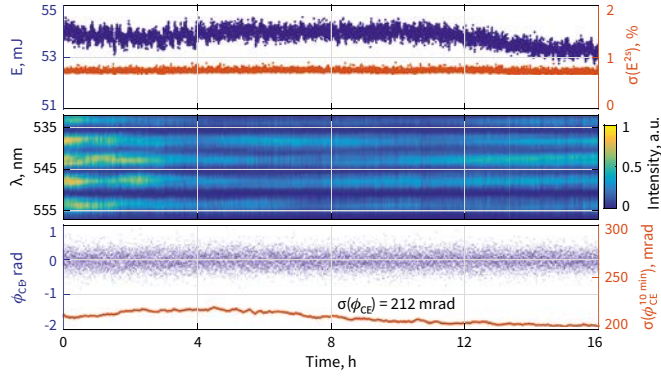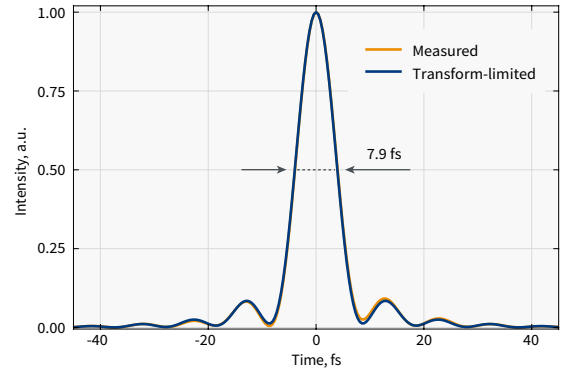
CLASS 4 LASER PRODUCT

LIGHT CONVERSION

High-dynamic-range third order autocorrelation
measurement of an OPCPA-HE system

OPCPA-HE output spectrum

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

Temporal profile of OPCPA-HE output pulses measured
with a self-referenced spectral interferometry device

LIGHT CONVERSION