

Broad-Bandwidth Mid-Infrared Optical Parametric Amplifier



Broad-bandwidth MIR pulses at high repetition rate

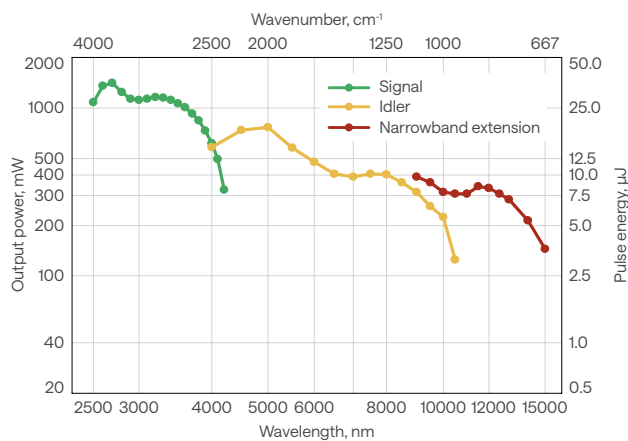
Continuously tunable in 2500 – 15000 nm range

Short-pulse high-energy auxiliary output at 2000 nm

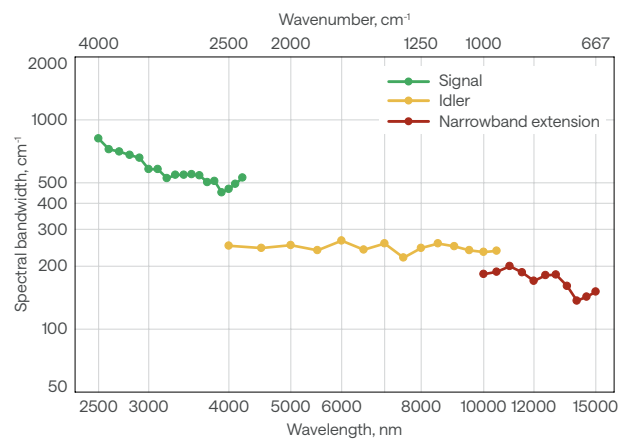
Pumped by industrial-grade lasers for high stability

CEP-stable option

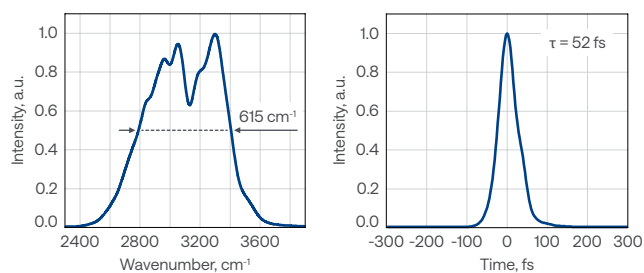
ORPHEUS-MIR typical tuning curves
Pump: 80 W, 2 mJ, 40 kHz



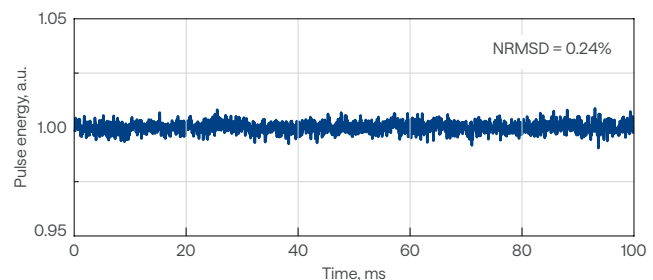
ORPHEUS-MIR typical spectral bandwidth



ORPHEUS-MIR typical output spectrum (left) and pulse duration (right) measured at ≈ 3000 nm



ORPHEUS-MIR pulse-to-pulse energy stability measured at ≈ 3000 nm



Specifications

MAIN OUTPUT (2500 – 10 000 nm)

Mode of operation	Non-collinear	Collinear ¹⁾
Tuning range	2 500 – 4 000 nm (signal) 4 000 – 10 000 nm (idler)	2 500 – 4 500 nm (signal) 4 500 – 10 000 nm (idler)
Maximum pump power	80 W	
Pump pulse energy	200 μ J – 3 mJ	
Pulse duration	< 100 fs	< 400 fs (< 100 fs with dispersion compensation) ¹⁾
Conversion efficiency ²⁾	> 1.2% @ 3 000 nm > 1.0% @ 3 500 nm > 0.6% @ 5 000 nm > 0.3% @ 9 000 nm	
Spectral bandwidth ³⁾	> 300 cm^{-1} @ 2 500 – 4 000 nm > 200 cm^{-1} @ 4 000 – 10 000 nm	
Long-term power stability, 8 h ⁴⁾	< 2% @ 5 000 nm	
Pulse-to-pulse energy stability, 1 min ⁴⁾	< 2% @ 5 000 nm	

AUXILIARY OUTPUT (2 000 nm)

Output wavelength ⁵⁾	2000 \pm 100 nm
Pulse duration	< 50 fs
Conversion efficiency ²⁾	> 8%
Spectral bandwidth	> 350 cm^{-1}

WAVELENGTH EXTENSION (10 000 – 15 000 nm)

Tuning range ⁶⁾	10 000 – 15 000 nm	n/a
Pulse duration	< 350 fs	
Conversion efficiency ²⁾	> 0.2% @ 12 000 nm	
Spectral bandwidth	100 – 275 cm^{-1}	

PUMP LASER, ENVIRONMENTAL & UTILITY REQUIREMENTS

Refer to www.lightcon.com

¹⁾ Collinear mode is achieved with additional external separator box. Dispersion compensation is optional.

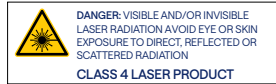
²⁾ Specified as a percentage of pump power.

³⁾ Full width at half maximum (FWHM).

⁴⁾ Expressed as normalized root mean squared deviation (NRMSD).

⁵⁾ Not tunable, optimized for best overall performance. Not simultaneous to OPA output.

⁶⁾ Not available in collinear-output configuration.



Drawings

ORPHEUS-MIR drawings

