

ORPHEUS | F

Broad-Bandwidth Hybrid Optical Parametric Amplifier

FEATURES

- Combination of best OPA and NOPA features
- 650 – 900 nm and 1200 – 2500 nm tuning range
- Single-shot – 2 MHz repetition rate
- < 100 fs pulse duration
- Adjustable spectral bandwidth
- Long pulse mode for gap-free tunability

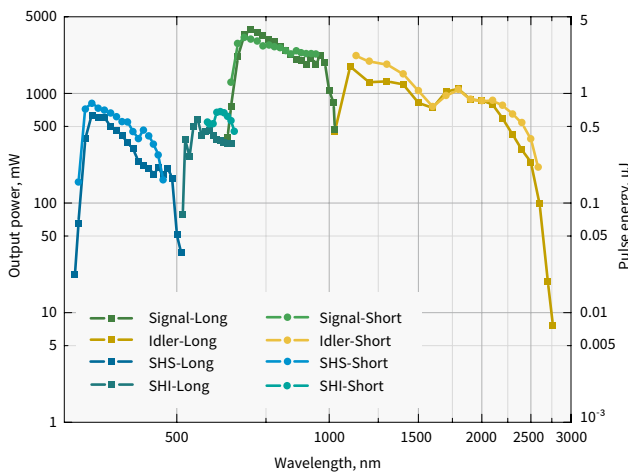


ORPHEUS-F is a hybrid optical parametric amplifier (OPA), combining the short pulse duration produced by a non-collinear OPA (NOPA) and the wide tuning range offered by a collinear OPA.

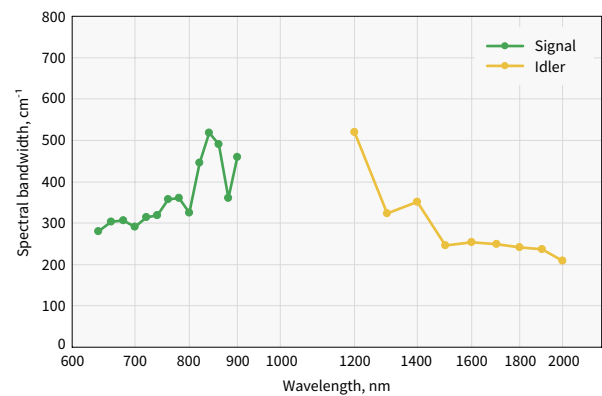
The Signal pulses of ORPHEUS-F are tunable in a 650 – 900 nm range and can be compressed with a simple prism-based compressor down to 25 – 70 fs pulse duration. The Idler pulses are tunable in a 1200 – 2500 nm range and reach

pulse duration of 40 – 100 fs. In addition, a long-pulse mode is available for accessing the 900 – 1200 nm tuning range; thus, enabling a gap-free tunability.

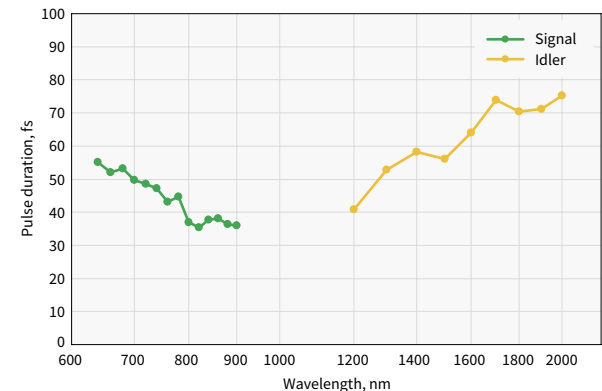
ORPHEUS-F provides significantly shorter pulses compared to the standard ORPHEUS model and a wider tuning range compared to the non-collinear ORPHEUS-N. Thus, for many scientific applications, ORPHEUS-F is the optimal choice.



Typical tuning curves of **ORPHEUS-F**.
Pump: 40 W, 40 μJ, 1000 kHz



Typical spectral bandwidth of ORPHEUS-F



Pulse duration after compression of ORPHEUS-F

For custom tuning curves visit
<http://toolbox.lightcon.com/tools/tuningcurves/>

SPECIFICATIONS

| Model | ORPHEUS-F | |
|------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------|
| MAIN OUTPUT (650 – 900 nm and 1200 – 2500 nm) | | |
| Mode of operation | Short pulse mode ¹⁾ | Long pulse mode |
| Tuning range | 650 – 900 nm (Signal) 1200 – 2500 nm (Idler) | 650 – 1010 nm (Signal) 1050 – 2500 nm (Idler) |
| Maximum pump power | 80 W | |
| Pump pulse energy | 10 – 500 μJ | |
| Conversion efficiency at peak ²⁾ | > 10% (Signal and Idler combined) | |
| Integrated 2H (515 nm) generation efficiency ³⁾ | > 35% | |
| Pulse duration before compression ¹⁾ | < 290 fs | |
| Spectral bandwidth | 200 – 750 cm ⁻¹ @ 650 – 900 nm | 75 – 220 cm ⁻¹ @ 650 – 900 nm |
| Pulse duration after compressor ¹⁾ | < 55 fs @ 800 – 900 nm < 70 fs @ 650 – 800 nm < 100 fs @ 1200 – 2000 nm | n/a |
| Compressor transmission | > 65% @ 650 – 900 nm > 80% @ 1200 – 2000 nm | |
| Long-term power stability, 8h ⁴⁾ | < 2% @ 800 nm | |
| Pulse-to-pulse energy stability, 1 min ⁴⁾ | < 2% @ 800 nm | |

WAVELENGTH EXTENSION OPTIONS (325 – 15000 nm) ⁵⁾

| | | |
|--------------------|---------------------------|--------|
| 325 – 450 nm (SHS) | > 1% | n/a |
| 325 – 505 nm (SHS) | n/a | > 1% |
| 525 – 650 nm (SHI) | | > 0.5% |
| 600 – 650 nm (SHI) | > 0.5% | n/a |
| 210 – 252 nm (FHS) | n/a | > 0.1% |
| 263 – 325 nm (FHI) | | > 0.1% |
| 2500 – 15000 nm | See ORPHEUS-MIR (page 38) | |

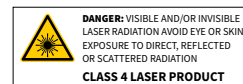
¹⁾ In short pulse mode, broadband pulses are compressed externally. Typical pulse duration before compression: 120 – 250 fs, after compression: 25 – 70 fs @ 650 – 900 nm, 40 – 100 fs @ 1200 – 2000 nm.

²⁾ Specified as percentage of pump power.

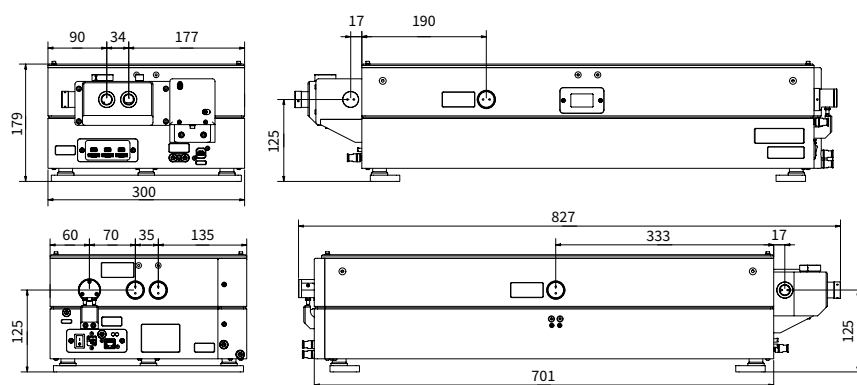
³⁾ At designated output port; not simultaneous to OPA output.

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

⁵⁾ For > 15 μJ pump pulse energy.



DRAWINGS



ORPHEUS-F drawings