

ffOPO series

The revolutionary fiber-based design the ffOPO cavity results in an ultra-compact and completely passively stable system, with nearly shot noise limited performance. The ffOPO provides several hundreds of milliwatts of femtosecond radiation in the range of 1.35 μm to 2.0 μm with gap-free rapid tunability. Up to 2.5 W can be generated with its post-amplified version, the ffOPO-HP, with additional 0.5 W in the range of 2.1 μm to 4.3 μm . Its enormous output power allows for further frequency conversions to the visible or mid-infrared spectral range, which are optional available. The ffOPO(-HP) is completely automated and can be integrated into the housing of the NT&C High Power Yb-Oscillator for a highly user-friendly, tunable, and reliable femtosecond light source.

Specifications ¹	ffOPO	ffOPO-HP
Tuning Range ² <ul style="list-style-type: none"> • Signal • Idler 	1350 – 2000 nm (2150 nm – 4300 nm) ³	1350 – 2000 nm 2150 nm – 4300 nm
Tuning Speed ⁴ <ul style="list-style-type: none"> • Random wavelength • Sweep (continuous⁵) 	< 15 s >20 nm/s (>5 nm/s)	< 20 s >16 nm/s (>4 nm/s)
Average Power ⁶	500 mW (at 1500 nm)	2.5 W (at 1500 nm)
Repetition Rate ⁶	40 MHz	40 MHz
Pulse Width ⁶ (FWHM)	300 – 500 fs (typ.)	300 – 500 fs (typ.)
Time-Bandwidth Product	0.35 – 0.5 (typ.)	0.35 – 0.5 (typ.)
Power Stability ⁶	< $\pm 1\%$	< $\pm 0.5\%$
Beam Quality (M ²)	To be determined (close to TEM00)	To be determined (close to TEM00)
Polarization	Horizontal	Horizontal
Warm-up Time ⁶	30 min (typ.)	30 min (typ.)
Pump Requirements ⁶ <ul style="list-style-type: none"> • Wavelength • Threshold Pulse Energy⁶ 	1040 +/- 20 nm 15 nJ	1040 +/- 20 nm --

¹ Specifications are subject to change without further notice

² Degenerate operation is possible upon request

³ Idler output available upon request for ffOPO, but included in ffOPO-HP by default.

⁴ For automated version, manual operated versions are available upon request

⁵ Output enabled while tuning, output power limited

⁶ Precise specs are pump laser dependent, for compatibility with custom pump laser please contact NT&C sales

Add-ons:

- Automatic wavelength calibration
- Dual/Triple OPO system, optically synchronized
- SHG (manual tuning)
- DFG: tuning range 4 – 20 μm with up to 100 mW average power (manual tuning)

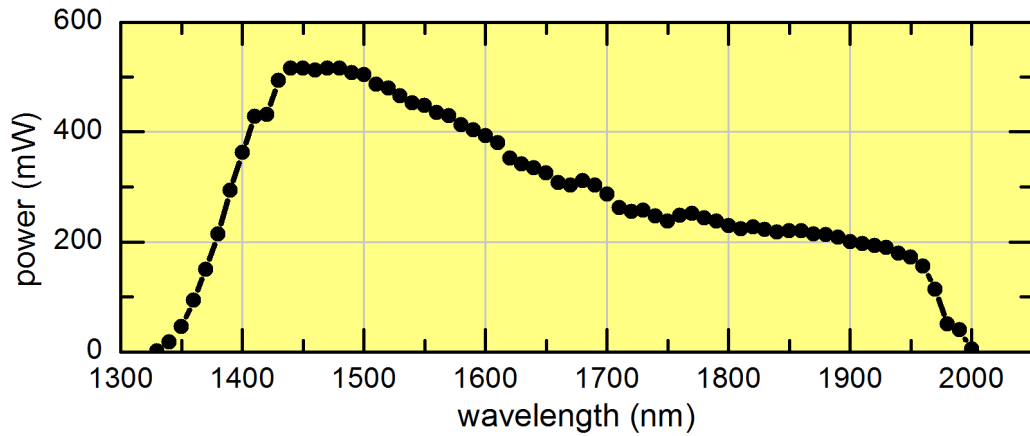
New Technologies and Consulting

Address: Hauptstrasse 52, D- 67297 Marnheim, Germany

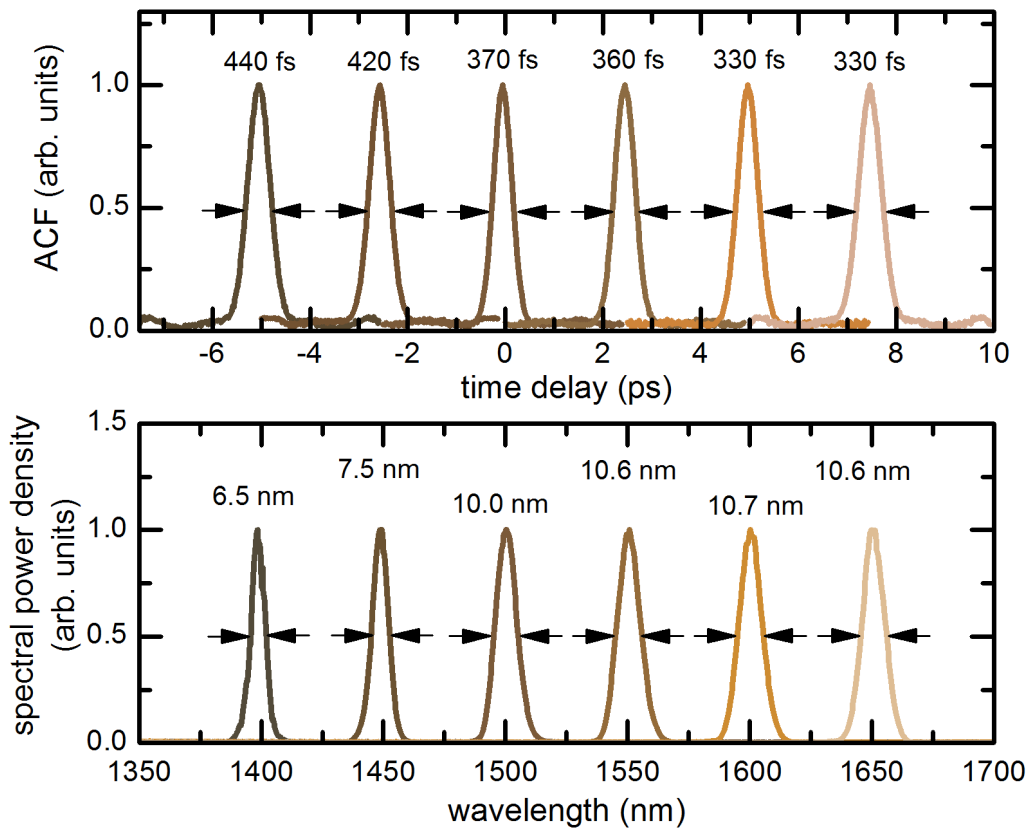
Phone: +49 6352 7190 252 | **E-mail:** giessen@ntandc.de

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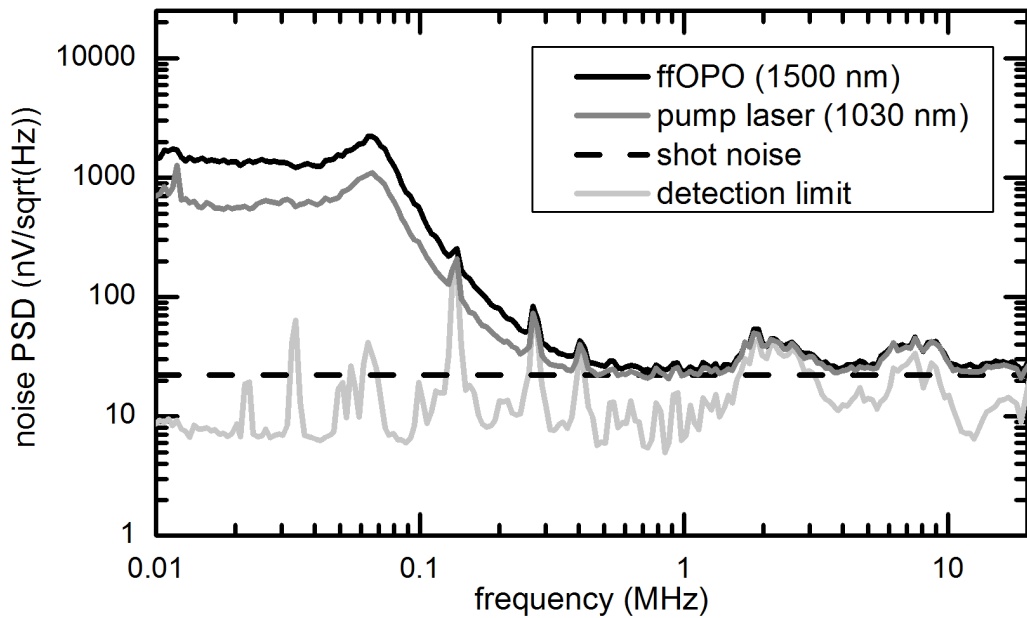
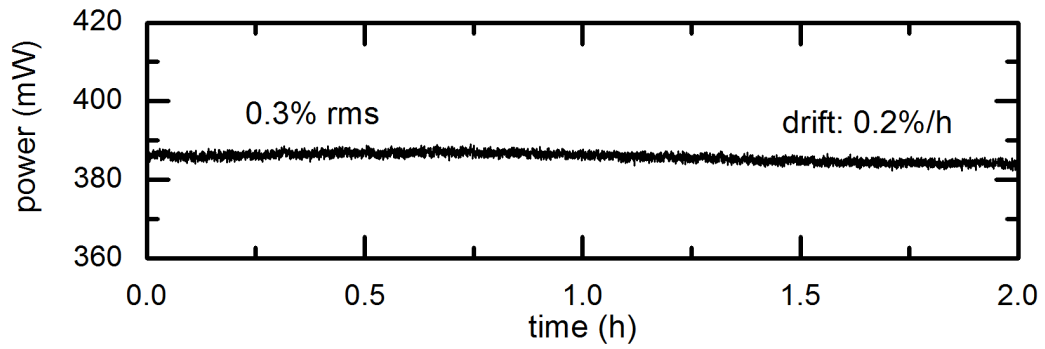
Typical performance: ffOPO



OPO tuning range and signal power.

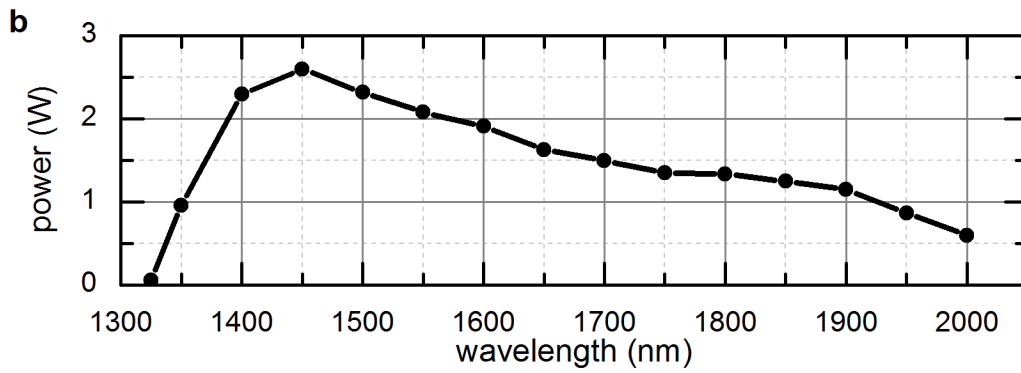
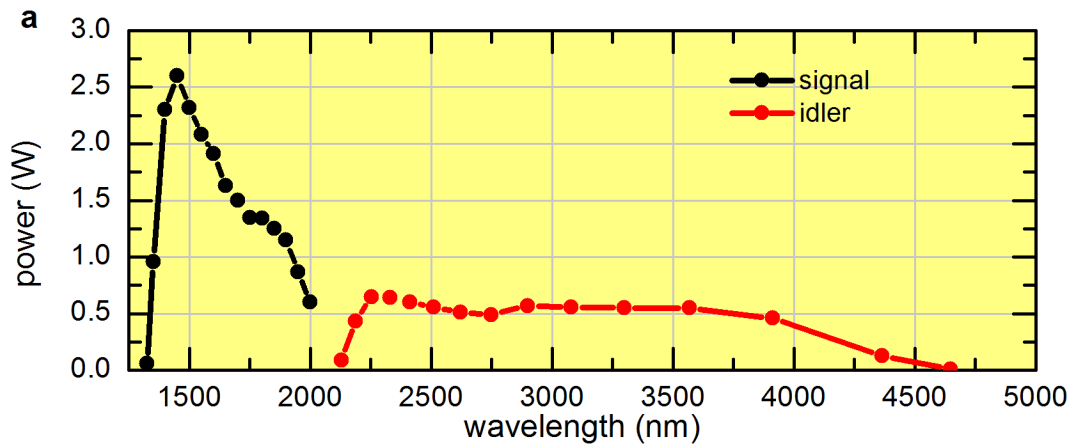


OPO signal autocorrelation (top) and corresponding spectrum (bottom).

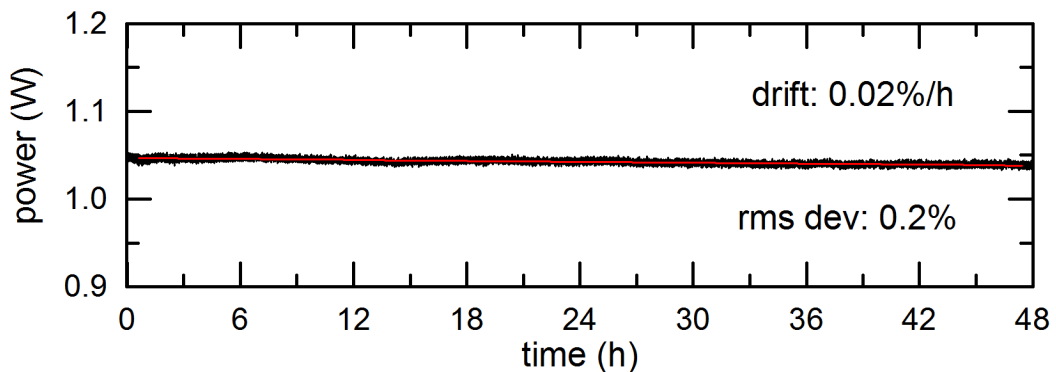


Free-running average power stability (1500 nm) and noise spectral power density (PSD).

Typical performance: ffOPO-HP

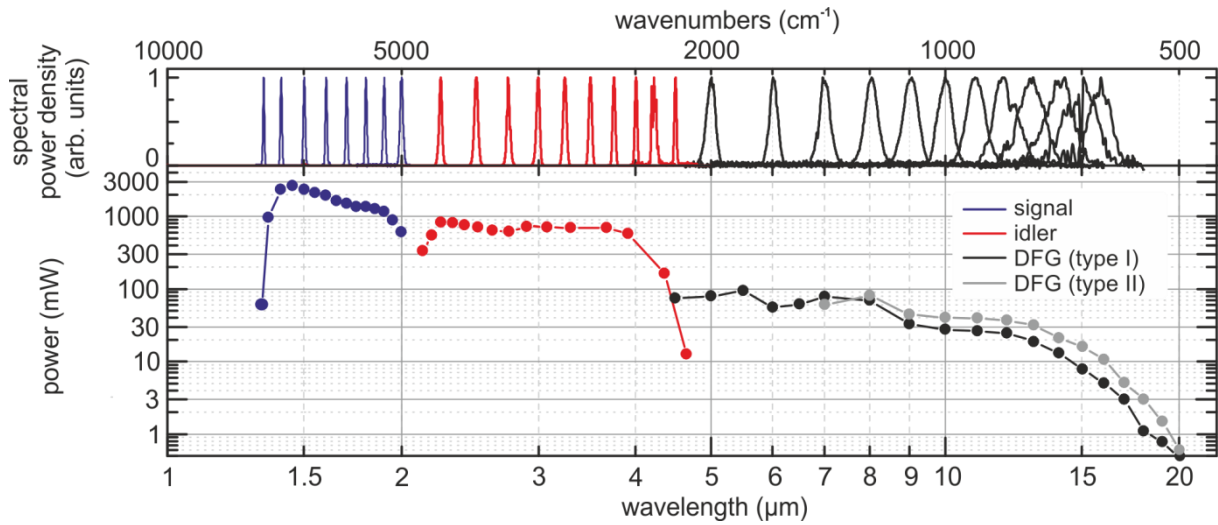


Combined signal and idler tuning range and average power (a) and detailed signal average power (b).

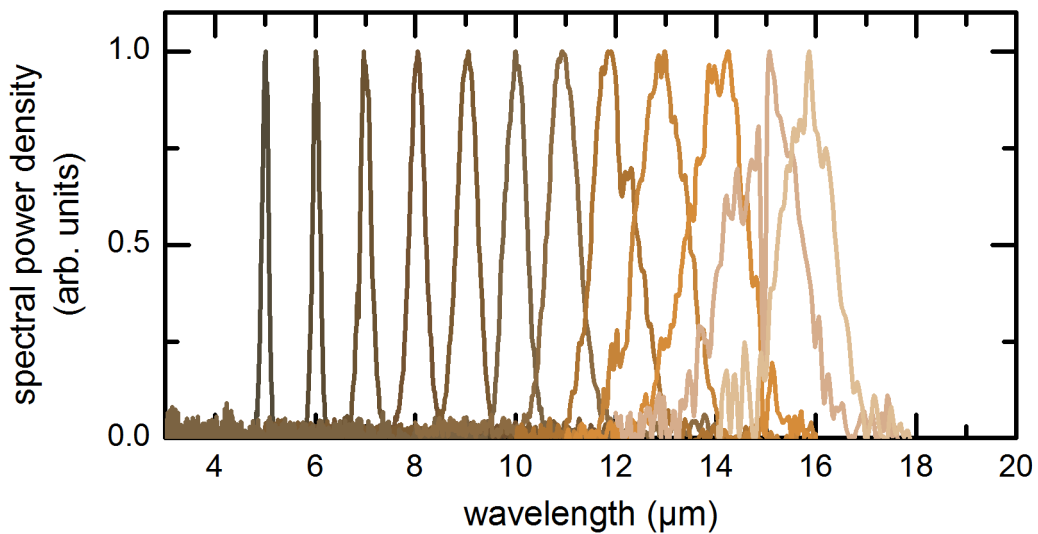


Free-running signal stability over 48 h, measured at 1550 nm. The -HP option reduces the free-running average power drift to 0.02%/h.

Typical performance: DFG add-on



Combined tuning range and output power of signal (blue), idler (red), and DFG (black, gray).



DFG spectra from 5 to 16 μm.