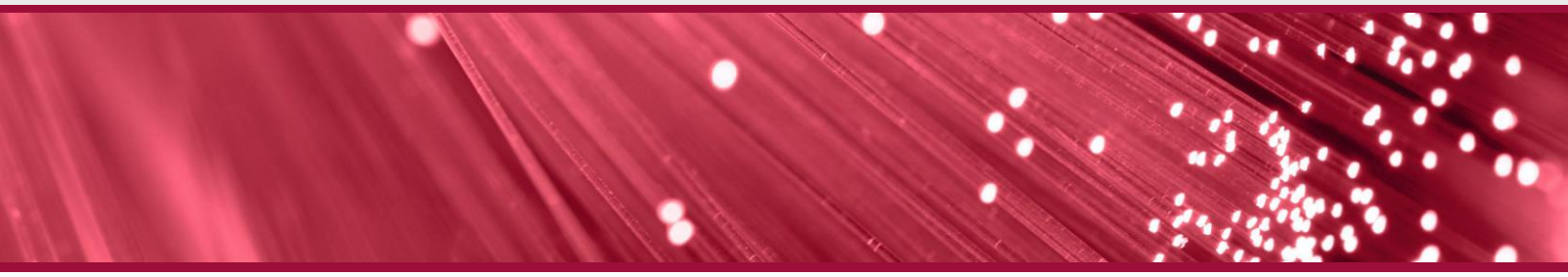
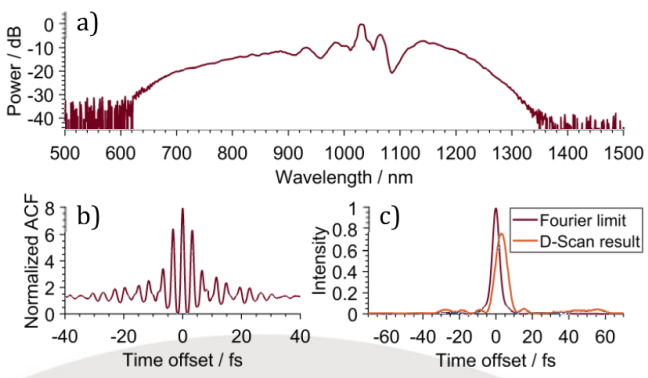
FEW-CYCLE SOURCES & **CEP** STABILITY

activefiber systems



ADD-ON: NONLINEAR COMPRESSION

Nonlinear compression is an elegant way to shorten the pulse duration of pulses beyond the capabilities of the employed laser gain medium. It is characterized by highest beam quality and stability, power scalability and high efficiency. AFS offers different versions of nonlinear-compression add-ons, that can be applied to a large span of pulse energies. These are ranging from µJ to several mJ supporting average powers up to the kW-range and enabling high-quality few-cycle pulses when starting from pulses in the range of 300 fs.



Exemplary spectral and temporal characterization of the output pulses with (a) optical spectrum; (b) Interferometric autocorrelation function (ACF); (c) Pulse profile retrieved by the D-Scan measurement corresponding to a pulse duration of ~7.6fs

[E. Shestaev et al. Opt. Lett. **45**, 97 (2020).]

	Few-cycle configuration	<40fs Configuration
Pulse energy (output)	up to 5 mJ	up to 8 mJ
Average power (output)	up to 500 W	up to 800 W
Pulse duration	down to 6fs	down to 38 fs
Central wavelength	1030nm or 1950nm (with reduced performance)	
Polarization	linear	linear
Beam quality	Close to diffraction-limited, $M^2 < 1.3$	
RIN slow	between 0.5% RMS .... 1.5%RMS [1/(24h)...1Hz], depending on driving laser	
RIN slow	between 0.5% RMS .... 1.5%RMS [1Hz...f_{rep}/2], depending on driving laser	
Beam pointing	< 10 µrad RMS	
CEP-noise (with CEP-Addon)	<250mrad [1mHz...f_{rep}/2]	typically not required

The specs above show only examplary configurations. Please inquiry about your individual parameter set.

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CEP

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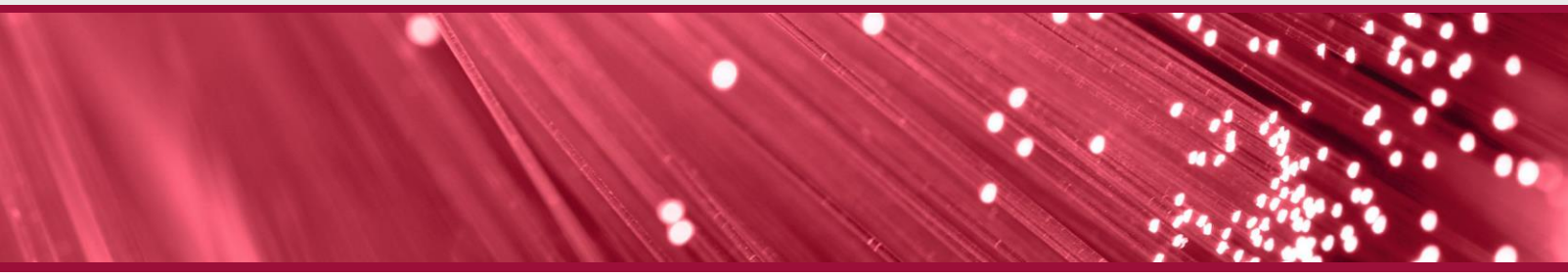
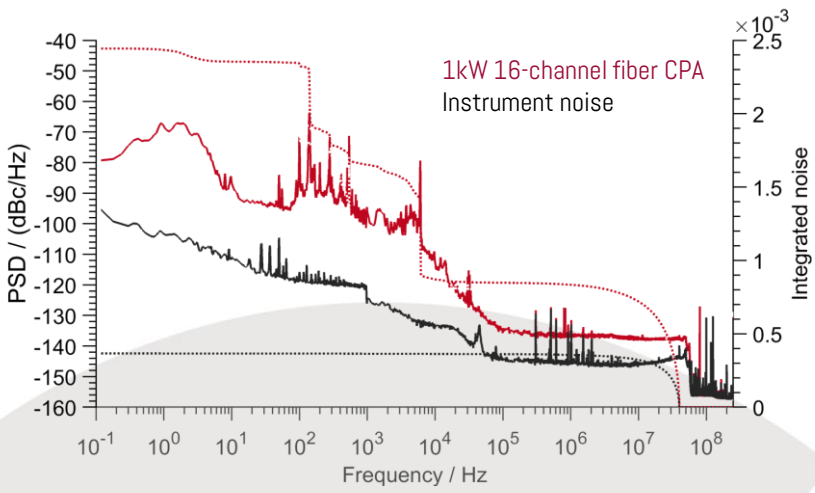


ADD-ON: CEP-STABILITY

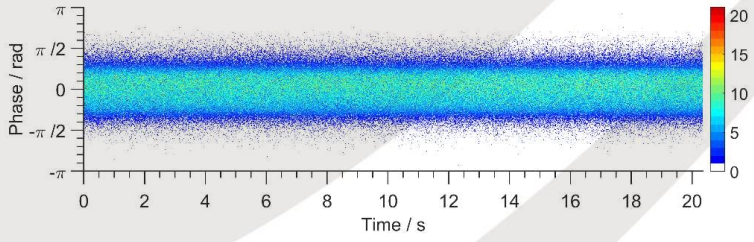
A stable carrier-envelope phase is a key requirement for many applications. In particular when working with few-cycle pulse durations it is often a necessity not only for atto-second science. AFS offers system designs enabling ultra-low CEP-noise for all our CPAs up to kW average power levels. Furthermore we can provide the required oscillators, detection and feedback system to keep the CEP noise at a minimum, enabling your applications.

Components for CEP-stable laser systems:

- CEO-stable oscillator
- CEP-preserving CPA design
- CE detection setup
- Control loop



Noise spectrum and integrated relative intensity noise (RIN) of a 16-channel fiber-CPA system compared to the instrument noise of the measurement setup. The CEP noise integrated from 1 mHz to $f_{rep}/2$ is < 250 mrad.



Exemplary single-shot measurements of the phase noise of a CEP-stable high-power few-cycle fiber laser system running at 100kHz.

MORE INFORMATION

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SCAN ME

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