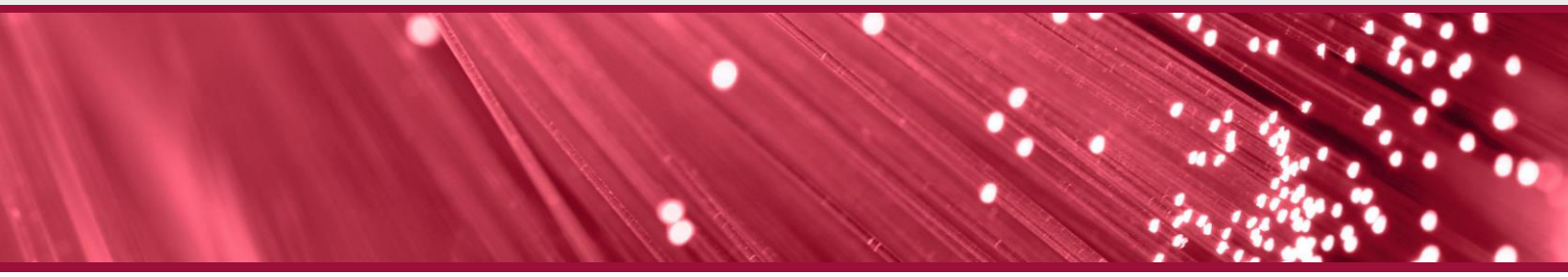
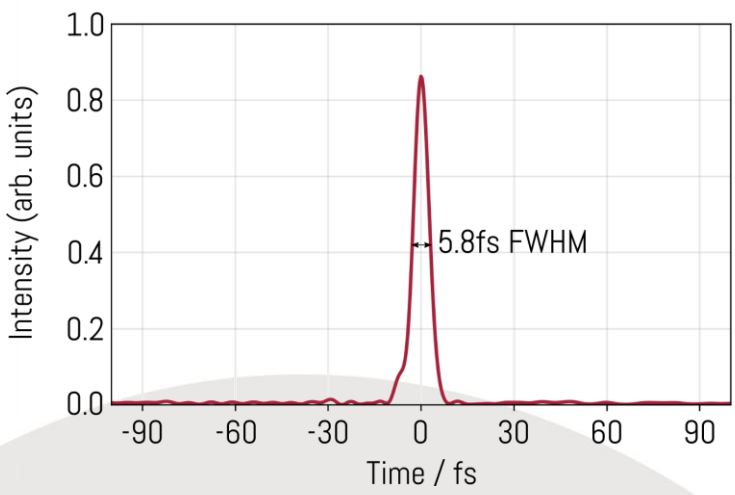
FEW-CYCLE SOURCES & **CEP** STABILITY

Member of the TRUMPF Group



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 **also as stand-alone modules**, that can be applied to a large span of pulse energies. These can handle pulse energies 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 300fs.



Temporal laser-pulse profile of the output of an 8-channel fiber-CPA system obtained by D-Scan measurement corresponding to a pulse duration of 5.8fs

	Few-cycle configuration	<40fs configuration
Pulse energy (output)	up to 5mJ	up to 8mJ
Average power (output)	up to 500W	up to 800W
Pulse duration (output)	down to 6fs	down to 38fs
Efficiency	up to 57%	up to 95%
Central wavelength	800nm, 1030nm or 1950nm (with reduced performance)	
Polarization	linear	
Beam quality	close to diffraction-limited, $M^2 < 1.3$	
RIN slow (average-power stability)	between 0.5% RMS .... 1.5%RMS [1/(24h)...1Hz], depending on driving laser	
RIN slow (pulse-energy stability)	between 0.5% RMS .... 1.5%RMS [1Hz...f_{rep}/2], depending on driving laser	
Beam pointing	< 10µrad RMS	
CEP-noise (with CEP-Addon)	down to 250mrad [1mHz...f_{rep}/2]	typically not required

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

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CEP

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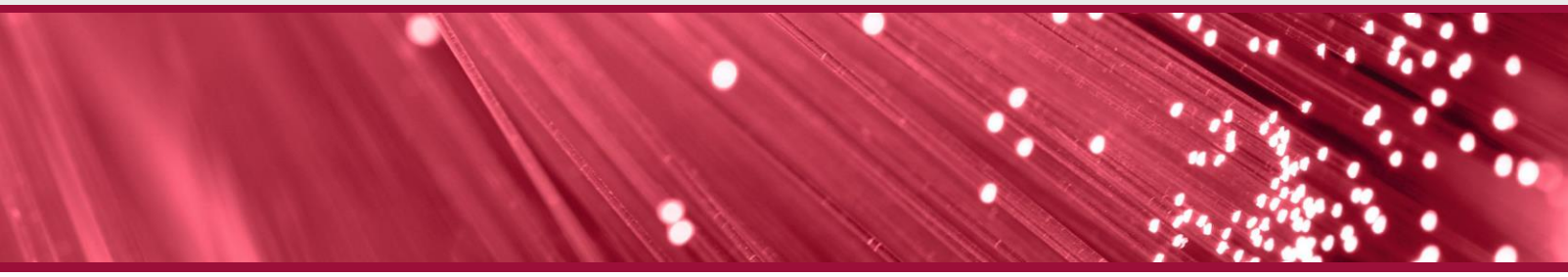
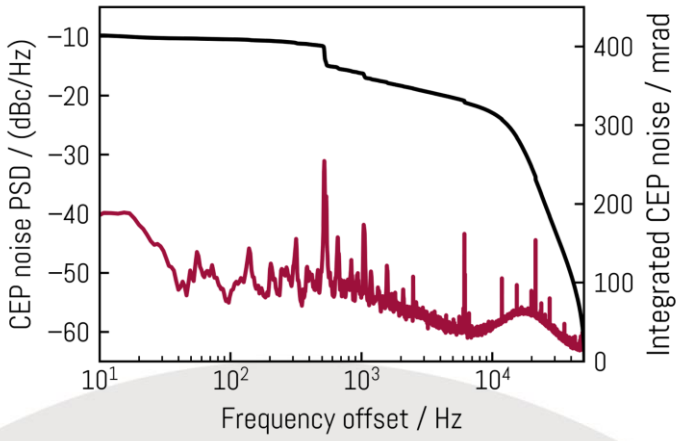


ADD-ON: CEP-STABILITY

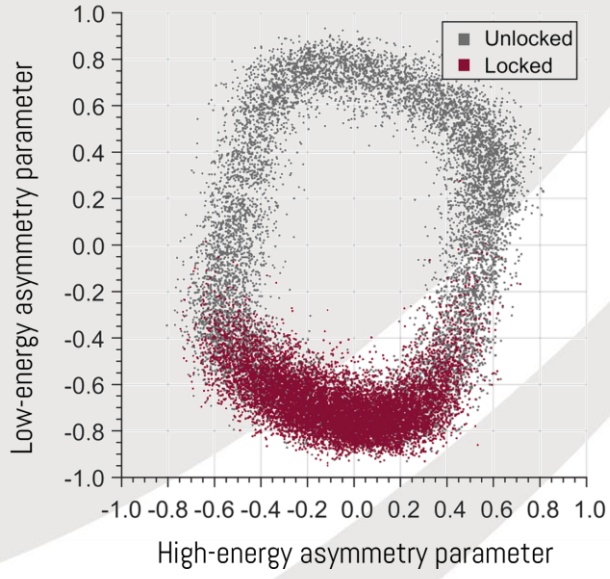
A stable carrier-envelope phase is a key requirement for many applications. It often becomes necessary when working with few-cycle pulse durations in particular for attosecond science. AFS system designs enable **ultra-low CEP-noise** for all our CPAs up to kW average power levels. Furthermore, we can provide the required oscillators, detection and feedback system to keep the CEP noise at a minimum enabling even the most demanding applications.

Components for CEP-stable laser systems:

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



Noise spectrum and integrated intensity noise of an 8-channel fiber-CPA system. The CEP noise integrated from 2 Hz to $f_{rep}/2$ is <420 mrad.



Parametric asymmetry plot measured by a stereo-ATI pulsemeter. Each symbol corresponds to one measurement. The distance to the center indicates pulse duration, the angle corresponds to the CEP. Grey symbols correspond to the case of unlocked CEP, the orange symbols indicate active stabilization of the oscillators CEO.

MORE INFORMATION

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SCAN ME

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Few-cycle