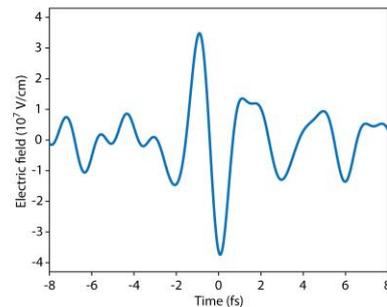
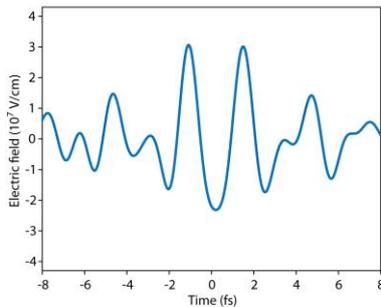


Light Field Synthesizer



We present the first commercial Light Field Synthesizer enabling synthesis and sub-femtosecond control of super-octave light transients.

Key Product Features:

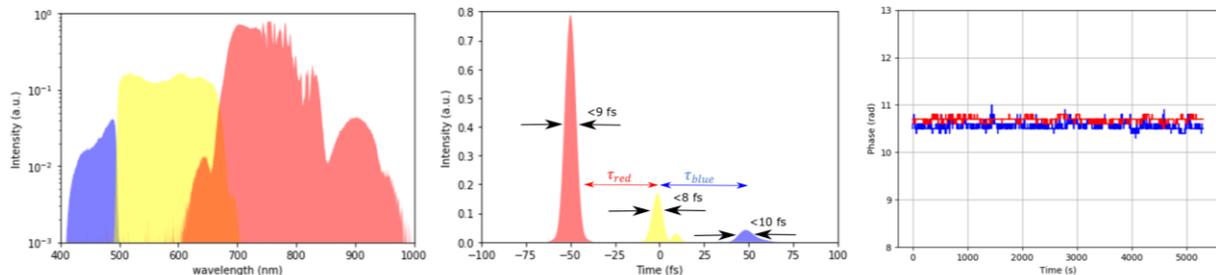
- **Shortest pulse available**
2 fs FWHM
- **Overall transmission**
>60% @ 9 mm beam
>70% @ 7 mm beam
- **Parallel pulse compression of multiple channels:**
<9 fs (700-1000 nm)
<8 fs (500-700 nm)
<10 fs (400-500 nm)
- **Attosecond-scale delay among the channels**
- **Interferometric stability**
Short term passive stability: <100 mrad
Long term active-loop stability: <50 mrad
- **Incident polarization:**
s and p polarization
- **Laptop and user-friendly software interface included**
- **Footprint**
30 x 20 cm²

Specifications:

	LFS		
Number of channels	3		
Wavelength range	400-1000 nm		
Input energy	>290 μ J (700-1000 nm)	>60 μ J (500-700 nm)	>14 μ J (400-500 nm)
Introduced dispersion	> -380 fs ²	> -370 fs ²	> -560 fs ²
Temporal accuracy	2 nm \pm 7 as		
Maximum delay	60 ps		
Polarization	s- and p-polarized input light		
Optics size	0.5 inch		
Overall transmission	>60% @9 mm beam >70% @7 mm beam		
Footprint	30 x 20 cm ²		

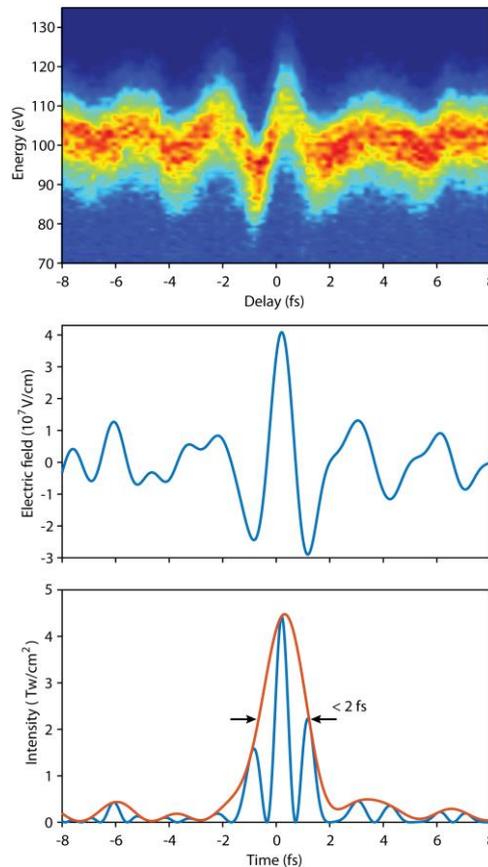
Working principle

The LFS is based on the spectral division of coherent supercontinuum into three different bands (channels) by chirped dichroic beamsplitters and their interferometric spatio-temporal superposition to synthesize a field waveform. All constituent pulses from the channels of the LFS are temporally compressed by chirped mirrors down to pulse duration of <10 fs. Introducing different time-delays among the channels enables the shaping and sub-cycle control of the field waveform.



Left) Spectral splitting of the different channels. Center) Parallel channel compression and temporal overlap with attosecond resolution. Right) Passive interferometric stability between different channels over more than hour.

Due to its solidness, compactness and excellent thermal capabilities, the LFS is very good at maintaining the optical paths among the different channels fixed for many hours. Passive short term stability is less than 100 mrad. Furthermore, an extra active-controlled loop improves the interferometric stability up to <50 mrad. Apart from the generation of waveforms, the LFS offers as well the shortest pulses available in market to date, see below:



References:

- [1] A. Wirth *et al.*, "Synthesized Light Transients," *Science* **334**(6053), 195-200 (2011).
- [2] M. Th. Hassan *et al.*, "Optical attosecond pulses and tracking the nonlinear response of bound electrons," *Nature* **530**, 66-70 (2016).