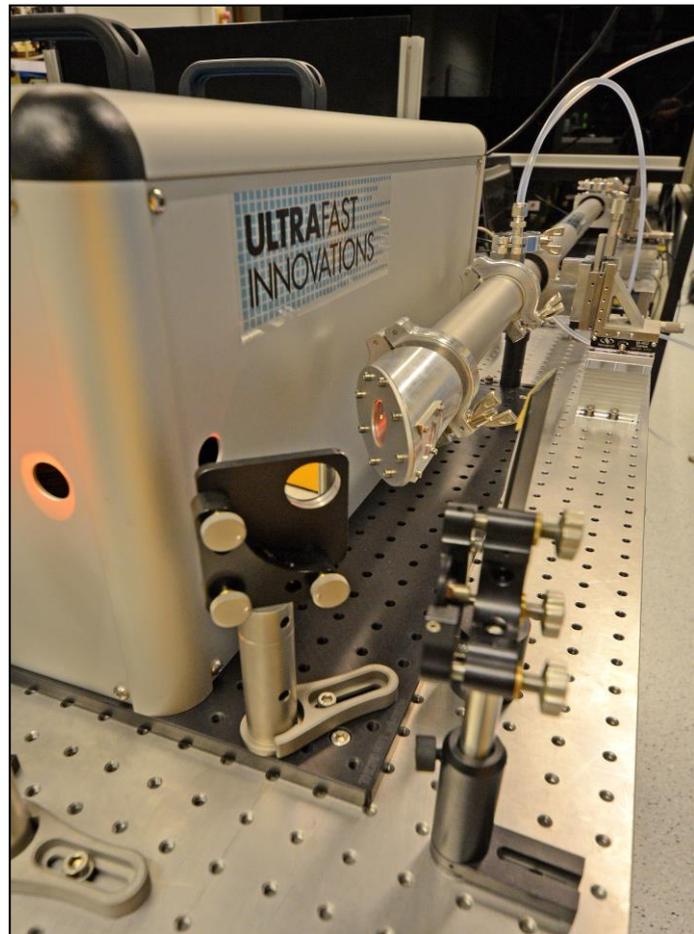


Hollow core fiber compressor

The hollow core fiber compressor spectrally broadens high-energy femtosecond input pulses by nonlinear interaction with a noble gas of adjustable gas pressure inside a hollow fiber. Chirped mirrors compress the pulses after the fiber, and the increased spectral width supports shorter pulse durations than the original input. Effectively, the device compresses the input pulses temporally by increasing their spectral bandwidth.

Specifications

- Rep rate:
up to 10kHz
- Input pulse energy:
0.5 - 2 mJ
(in conjunction with pulse duration)
- Input pulse duration:
up to 60 fs
(as short as possible)
- Typical compression factor:
5x – 6x
- Spectral bandwidth:
270 - 1000 nm
(achievable with all perfect inputs)
400 - 950 nm
(with usual commercial laser)
- Transmission (through fiber)
up to 70%



Different options and customization possible:

- Active beam-pointing stabilization unit
- Variable spectrum selection
- Flexible dispersion management
- Differentially-pumped device upon request

Mirror characterization

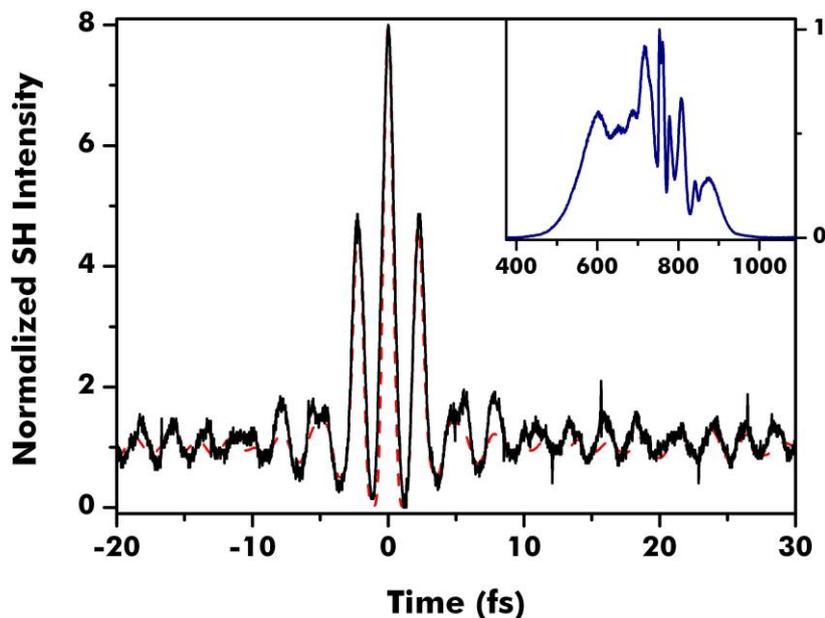
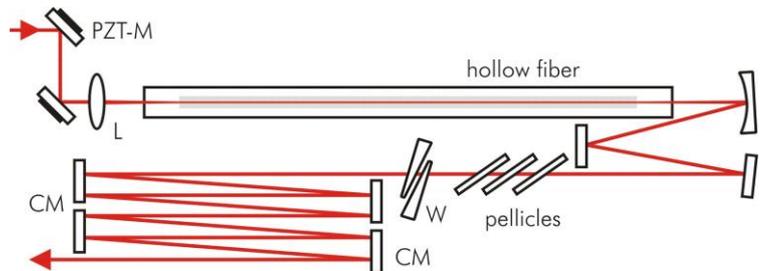
Bandwidth 500-1050nm; p-polarization
Reflectance >99% per bounce
Supported pulse duration <4 fs
(with appropriate input spectrum)
Angle of incidence 5°, resp. 19°



Compression measurement

Setup

- Chirped-pulse amplifier system (Femtolasers Femtopower Compact Pro)
 - 3kHz repetition rate
 - 900μJ pulse energy
 - 25fs pulse duration (FWHM)
- Hollow-core fiber
 - 250μm inner diameter
 - 1m length
 - neon gas
 - 2.0bar background pressure
- Mirror compressor
 - 10 reflections



Measured second-order autocorrelation (black curve). The dashed red curve shows the transform-limited autocorrelation function derived from the input spectrum (see inset). The reconstructed pulse duration is 3.0fs (FWHM). Inset: Supercontinuum spectrum generated in the hollow-core fiber (neon, 2.0 bar background pressure).