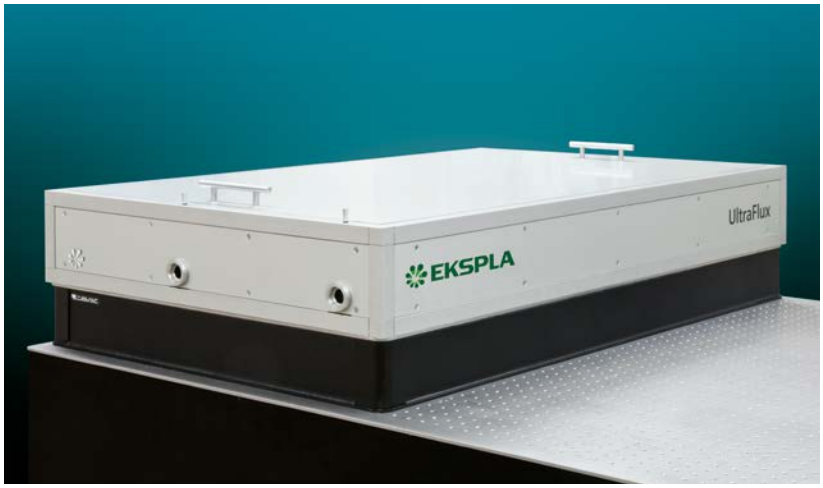
# UltraFlux
## FT300 SERIES

**Tunable Wavelength Femtosecond Laser Systems**




UltraFlux FT300 series is a compact high energy tunable wavelength femtosecond laser system which incorporates the advantages of ultrafast fiber laser, solid-state and parametric amplification technologies. Novel OPCPA front-end technology uses the same picosecond fiber laser for seeding both picosecond DPSS pump laser and femtosecond parametric amplifier by spectrally broadened output. This approach greatly simplifies the system – excludes femtosecond regenerative amplifier and eliminates the need of pump and seed pulse synchronization. In addition to that, contrast of the output pulses in picosecond to nanosecond time scale is potentially increased.

All UltraFlux series laser systems are assembled on a rigid breadboard to ensure excellent long-term stability. Modular internal design offers high level of customization and easy scalability. These systems can be customized according to customer requirements.

Incorporation of parametric amplification technology together with a novel ultrafast fiber laser helped to create and bring to the market a new tool for femtosecond pump-probe, nonlinear spectroscopy, emerging high harmonic generation experiments and other femtosecond and nonlinear spectroscopy applications. With this laser ultrafast science breakthrough is closer to any photonics lab than ever before.

### FEATURES

- *Based on the novel **OPCPA** (Optical Parametric Chirped Pulse Amplification) technology – simple and cost-efficient operation*
- *Patented front-end design (patents no. EP2827461 and EP2924500)*
- *Hands free wavelength tuning*
- *Up to **1 kHz** repetition rate*
- *Up to **3 mJ** pulse energy*
  - *Excellent pulse energy stability: < 1.5 % rms*
  - *Excellent long-term average power stability: < 1.5 % rms over > 12 hour period*
- *High contrast pulses without any additional improvement equipment*

### APPLICATIONS

- *Broadband CARS and SFG*
- *Femtosecond pump-probe spectroscopy*
- *Nonlinear spectroscopy*
- *High harmonic generation*

### OPTIONS

- ***SH/TH** harmonics module: SH **375 – 480 nm,** TH **250 – 320 nm***
- ***SH/TH/FH** harmonics module: SH **375 – 480 nm,** TH **250 – 320 nm** FH **210 – 230 nm***
- *Optically synchronized ps output*
- *PLL (Phase Locking Loop) for precise (<1 ps, rms) locking with external synchronization pulse*



EKSPLA

## SPECIFICATIONS [1]

| Model | UltraFlux FT031k | UltraFlux FT31k | UltraFlux FT310 |
|---|---|---|---|
| **MAIN SPECIFICATIONS** | | | |
| Max. Pulse energy | 300 µJ | 3 mJ | |
| SH output [4] | – | 20 % conversion at 440 nm | |
| TH output [4] | | 5 % conversion at 290 nm | |
| FH output [4] | | 1 % conversion at 220 nm | |
| Wavelength tuning range | | | |
| Standard version | 700 – 1010 nm | 750 – 960 nm | |
| SH output [4] | – | 375 – 480 nm | |
| TH output [4] | | 250 – 320 nm | |
| FH output [4] | | 210 – 230 nm | |
| Scanning steps | | | |
| SH output [4] | – | 5 nm | |
| TH output [4] | | 3 nm | |
| FH output [4] | | 2 nm | |
| Pulse duration | 35 – 60 fs | 20 – 60 fs | |
| Pulse repetition rate | 1 kHz | | 10 Hz |
| Pulse energy stability | < 1.5 %, rms | | |
| Long-term power stability | < 1.5 %, rms | | |
| Spatial mode | Super Gaussian | | |
| Beam diameter ($1/e^2$) | 2 mm | 7 mm | |
| Pulse contrast [2] | ≥ $10^{-6}$ : 1 (within ± 50 ps) | | |
| | ≥ $10^{-8}$ : 1 (in ns range) | | |
| Polarization | Linear, horizontal | | |
| Beam pointing stability | ≤50 µrad, rms | | |
| Optical to RF signal jitter [3] | < 1 ps | | |
| Footprint on optical table | 1.2 × 0.75 m | 1.2 × 2.0 m | |

[1] Presented parameters are from delivered systems and can be customized to meet customer's requirements.

[2] Pulse contrast is only limited by amplified parametric fluorescence (APF) in the temporal range of ~90 ps which covers OPCPA pump pulse duration and is better than $10^6$ : 1. APF contrast depends on OPCPA saturation level (Fig. below). Our system is ASE-free and pulse contrast value in nanosecond range is limited only by measurement device capabilities (third-order autocorrelator). There are no pre-pulses generated in the system and post-pulses are eliminated by using wedged transmission optics.

[3] With -PLL option purchased.

[4] With SH/TH or SH/TH/FH module.


## PERFORMANCE

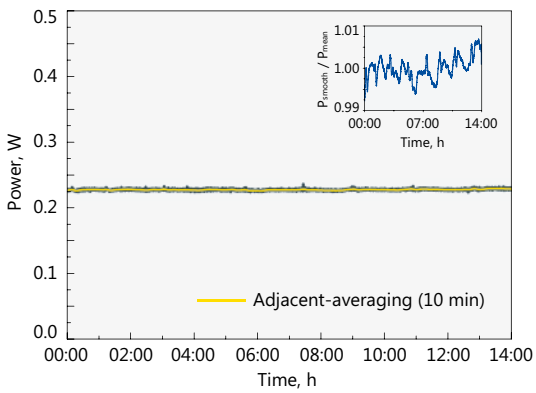



*Fig 1.* Long-term power stability measurement at 800 nm wavelength

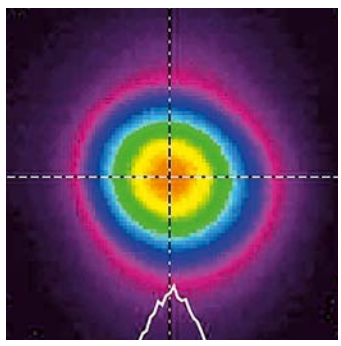


*Fig 2.* Typical beam profile of FT031k. Output pulse energy 0.3 mJ at 890 nm