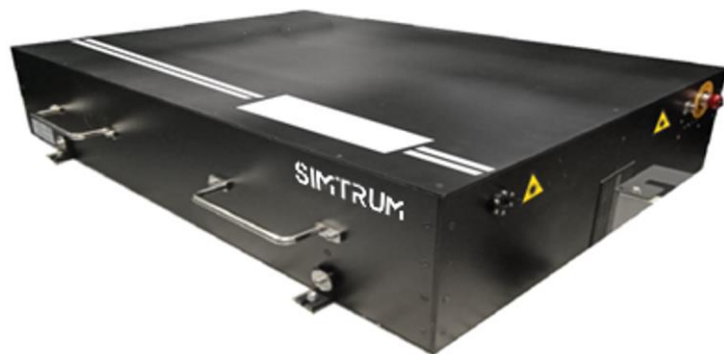




High-Power Femtosecond Solid-State Lasers STHO Series



2023 V1

For customized projects please Contact us:

info@simtrum.com

STHO series high-power femtosecond solid-state lasers combine laser diode direct pumping and chirped pulse amplification technology, offering a flexible range of parameters.

They are capable of delivering single pulse energies up to >2mJ, with the shortest pulse widths being <200fs, electronically adjustable up to 10ps. The fundamental frequency central wavelength is 1030nm, with frequency conversion capabilities to output 515nm, 347nm, 258nm wavelengths.

Users can select different repetition rates and output energies through software control, based on specific applications.

Features

- Up to 2mJ Single Pulse Energy Customizable
- Pulse Width Adjustable From 200fs to 10ps
- Maximum Output Power of 20W
- Repetition Rate: Single Shot to 100kHz
- Flexible Energy Attenuation

Applications

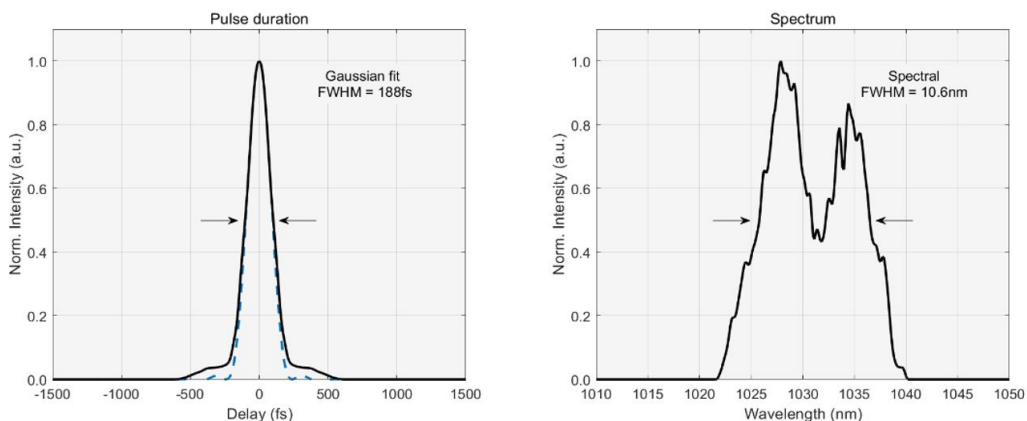
- Aerospace Precision Machining
- Terahertz Light Source
- High-order Harmonic Drive Source
- Optical Parametric Amplifier Drive Source
- Nonlinear Optics
- Ultrafast X-ray Generation
- Femtosecond Laser Direct Writing
- Femtosecond Pump-probe



Specifications

Model	STHO-10W	STHO-10W-HE	STHO-20W	STHO-20W-HE
Maximum Output Power	10W	10W	20W	20W
Maximum Single Pulse Energy	200/400μJ	1mJ	0.4/1mJ	2mJ
Pulse Duration	<250fs			
Pulse Duration adjustment Range	250fs-10ps			
Maximum Repetition Rate	Single shot ~1MHz Adjustable			
Pulse Selection	Single shot ~1MHz, Selectable Within Range			
Central Wavelength	1030±10nm			
Polarization	Linear Polarization, Vertical			
Beam Quality	M ² <1.2			
Beam Diameter	4-5mm	6mm	5mm	7mm
Pulse Pointing Stability	< 20 μrad/°C			
Pre-pulse Contrast	<1:1000			
Post-pulse Contrast	<1:500			
Pulse energy Stability	<1% RMS @8h,<1kHz			
Long-term Power Stability	<1% RMS @8h			
Mechanical Dimensions (Length x Width x Height)	877.3x823x243mm			
Extended Options				
Harmonic	Output Integrable, 515 nm, 343 nm, 257 nm			
Optical Parametric Amplifier	Output Integrable, 210-16000nm			

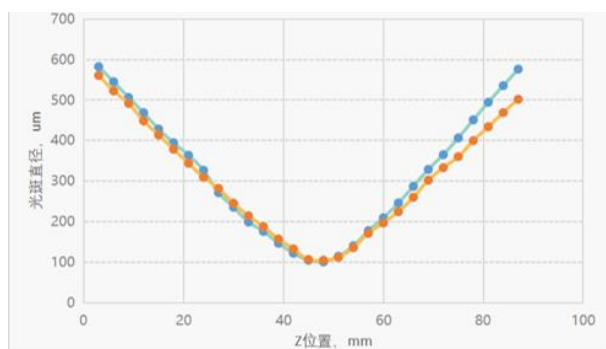
Test Data



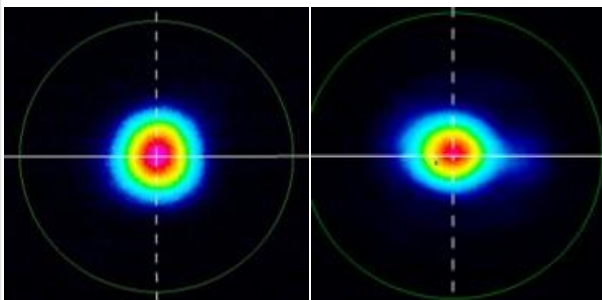
The STHO series of femtosecond solid-state lasers boast excellent pulse quality. The left image shows the output pulse curve of the STHO-10W-HE series.

The blue dashed line represents the Fourier Transform Limited pulse (FTL) from the spectrum on the right, indicating the optimal pulse width achievable by this laser.

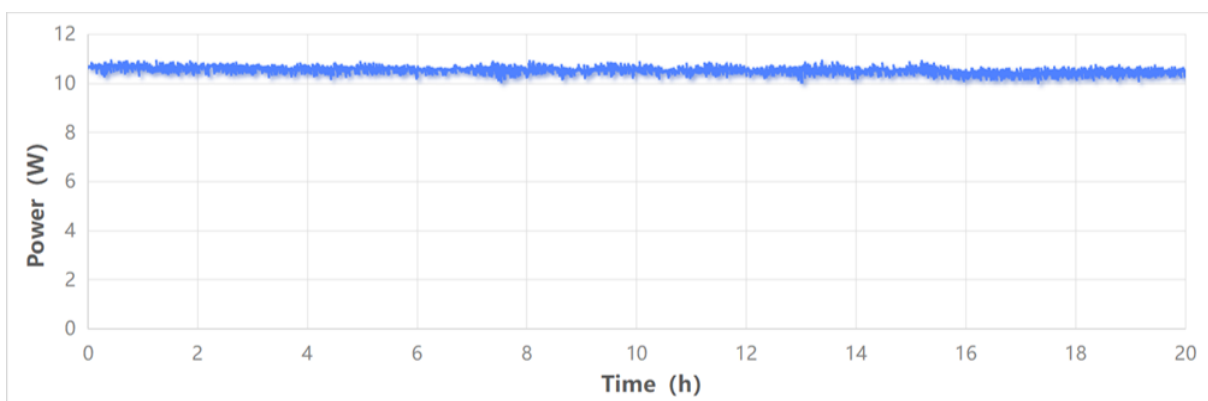
The black solid line is the actual measured autocorrelation curve, showing that at 1mJ energy output, the pulse width is very close to the FTL, with noise floor intensity less than 3% of the peak value, and the overall pulse intensity has a very small energy distribution beyond ± 500 fs.



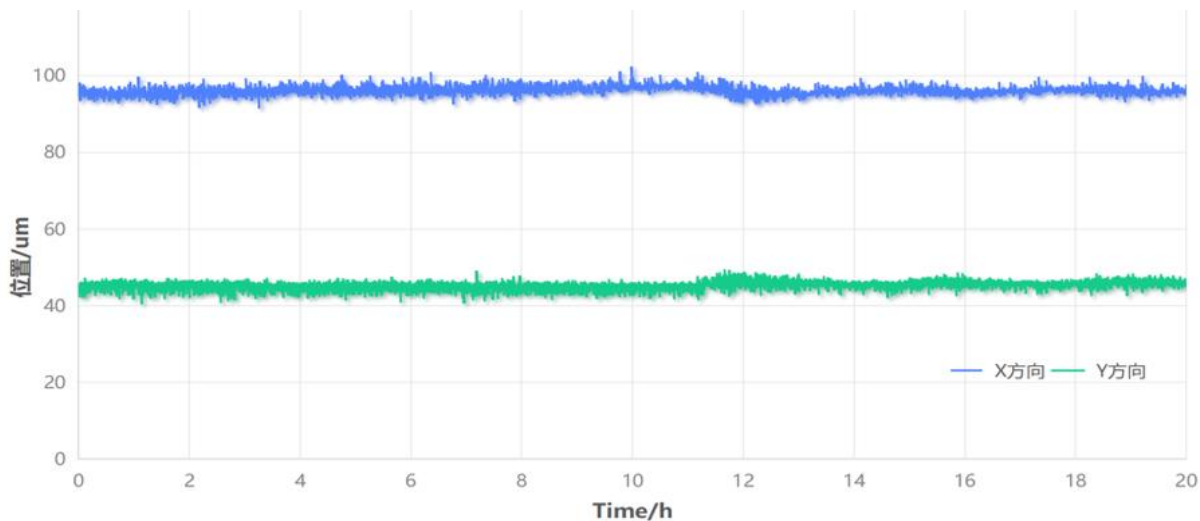
Beam quality $M^2 < 1.2$



Near field beam profile & Far field beam profile



Power stability, STHO-10W-HE 400uJ, 25kHz, 20 hours, RMS=0.46%



Long-term pointing stability (STHO-10W-HE 400uJ, 25kHz, 8 hours, <math>< 15 \mu\text{rad}/^\circ\text{C}</math>)

Mechanical Drawing

