AURORA-H

Ultrafast Pulse Femtosecond Optical Parametric Amplifier

AURORA-H is a hybrid optical parametric amplifier (OPA) that combines the short pulse duration generated by the non-collinear optical parametric amplifier (NOPA) with the wide tunability offered by the collinear OPA. This provides it with unique performance advantages, allowing its signal light to be tuned within the range of 650-900nm, while the idler light can be tuned within 1200-2500nm. Additionally, it can perform dispersion compensation to compress pulses to a duration of 50-100 fs.

AURORA-H is compatible with various market-standard fiber and solid Yb ultrafast lasers and supports one-click precise tuning, allowing customers to easily obtain the desired central wavelength output without complex manual adjustments. This not only greatly facilitates customers but also improves operational efficiency.

Product Features:

- **Optimal combination of collinear and non-collinear OPA**
- **Ultrafast pulses in the near-infrared spectrum (650-900nm and 1200-2500nm)**
- **Pulse duration <100 fs**

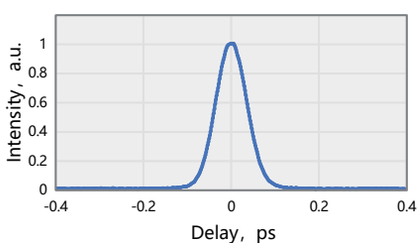
Narrow Pulse Width Tunable Light Source

Application Areas

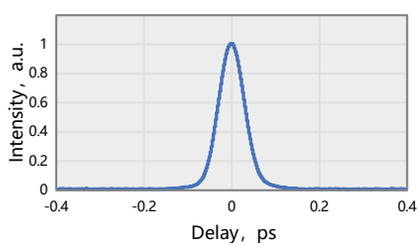
- Transient Absorption Spectroscopy
- Two-Dimensional Infrared Spectroscopy
- Fluorescence Spectroscopy
- Sum Frequency Generation
- Nonlinear Optics
- Stimulated Raman Scattering
- High Harmonics and X-ray Sources
- Attosecond Science

Parameter Specifications

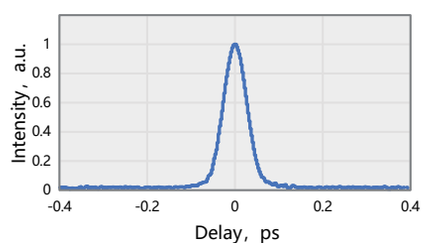
Parameter	AURORA-H-HP	AURORA-H-HE
Tuning range	650 – 900 nm (Signal)	
	1200 – 2600 nm (Idler)	
Maximum pump power	80 W	
Maximum pump energy	10 - 200μJ	200 - 2000μJ
Peak conversion efficiency	> 10% (Signal + Idler)	
Second harmonic Generation (515 nm) conversion	> 35 %	
Spectral bandwidth	200 – 750 cm^{-1} @ 650 – 900 nm	
Pulse duration after compressor	< 55 fs @ 800 – 900 nm	
	< 70 fs @ 650 – 800 nm	
	< 100 fs @ 1200 – 2000 nm	
Compressor transmission	> 65% @ 650 – 900 nm	
	> 80% @ 1200 – 2000 nm	
Long-term power stability	＜0.5% RMS,100h	
Pulse-to-pulse energy stability	< 1.5% @ 750 nm	
Typical pulse duration before compression	120 - 250 fs	
Dimensions (L×W×H)	740 x 408 x 222mm (LxWxH) (Compressor not included)	
Weight (kg)	47kg	
Remaining weight (kg)	32kg (Compressor) +24kg (Water-cooled machine) +17kg (frequency doubling)	
Power supply requirements	AC 220V/10A; 24V DC power supply, motor drive power supply, total power ≤ 15	
Power supply requirements for the water-cooled machine	CWUP-10AI; operating voltage 220V; operating current 0.6-5.6A; rated power 1.02kW; cooling capacity 0.75kW	



Typical pulse duration 52.7fs@700nm

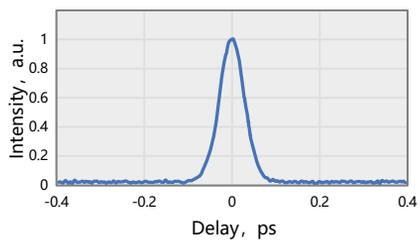


Typical pulse duration 43fs@750nm

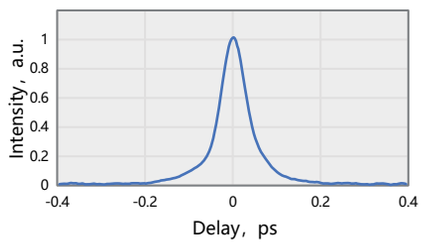


Typical pulse duration 39.7fs@800nm

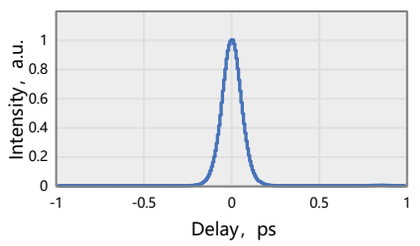
Narrow Pulse Width Tunable Light Source



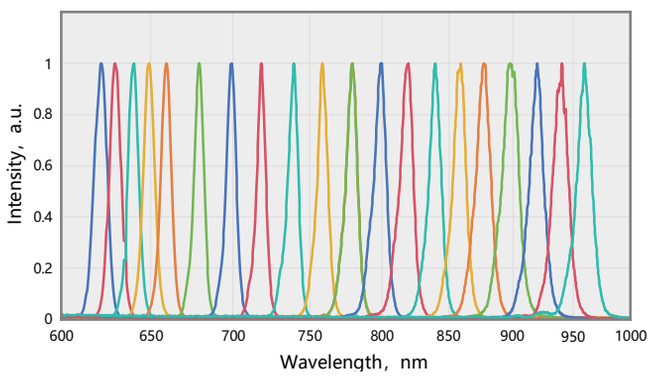
Typical pulse duration 42fs@850nm



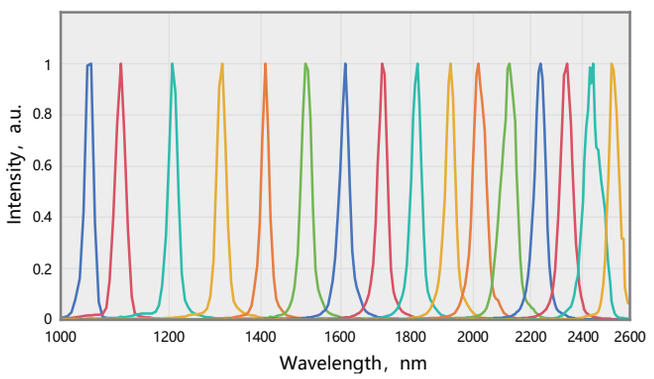
Typical pulse duration 43.1fs@900nm



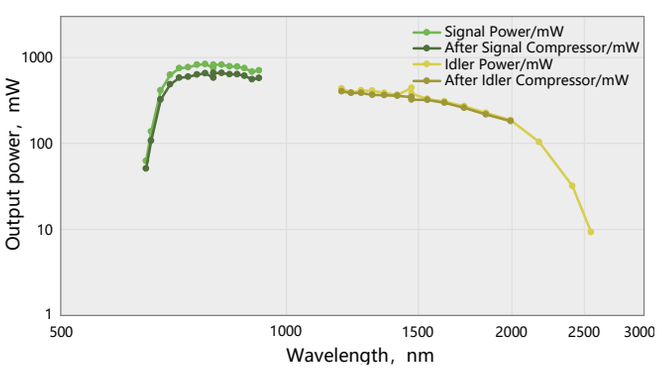
Typical pulse duration 81.3fs@1500nm



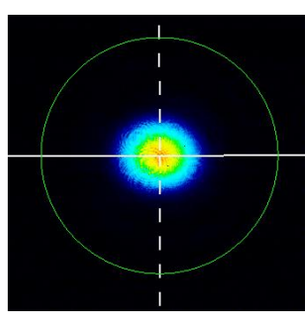
AURORA-H series signal light tuning spectrum(630nm-900nm)



AURORA-H series idler light tuning spectrum(1200nm-2600nm)

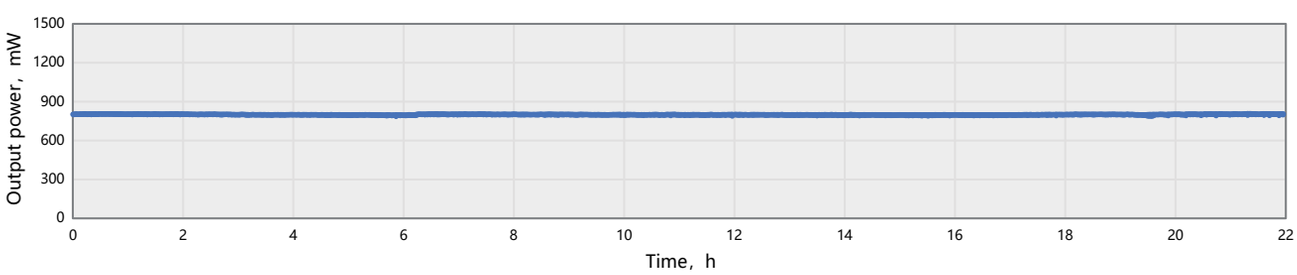


Typical AURORA-H tuning curves
Pump:50kHz/400uJ/257fs@HELIOS-20W-HP



Typical near-field beam profile

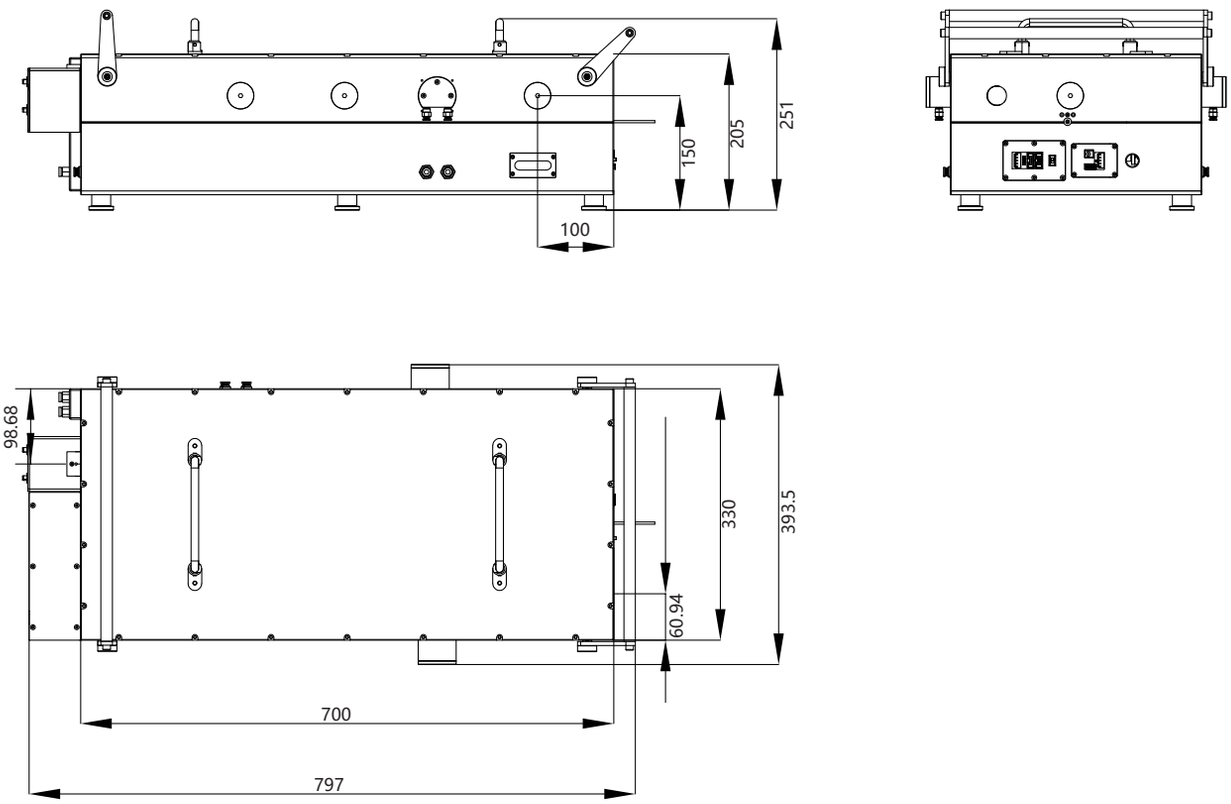
Stability Measurement



22-hour power stability of AURORA-H
RMS=0.36%@750nm OPA direct output parameters, without passing through the compressor

Narrow Pulse Width Tunable Light Source

Drawings



AURORA-H outline drawing