AVUS Optical Parametric Amplifier

High Power fs OPA

- AVUS is the very latest Optical Parametric Amplifier (OPA) providing widely tunable high-energy pulses. It is ideal for use with 1 µm femtosecond lasers and opens doors for up to 50 W pump power.
- The user-friendly and maintenance-free unit is air-cooled and constructed with a monolithic case design for long-term thermal stability, even at maximum pump power.
- The fully-automated and alignment-free unit covers a wide wavelength range, while the integrated tuning and automatic wavelength separation of the AVUS maintain the same beam position and direction for all wavelengths.

- OPA for 1 µm pump laser
- 50 W maximum pumping power
- Air-cooling and monolithic case for long-term temperature stability
- Tunable from 210 nm ... 11 µm (UV, VIS, IR)
- Completely automated and fully computer controlled
- Long-life operation with sealed inner case to protect sensitive components
- TCP/IP remote control with standardized command set for easy programming
- 24/7 integrated performance monitoring of both laser system and AVUS
- Optional bypass for SHG beam (green) and pump beam

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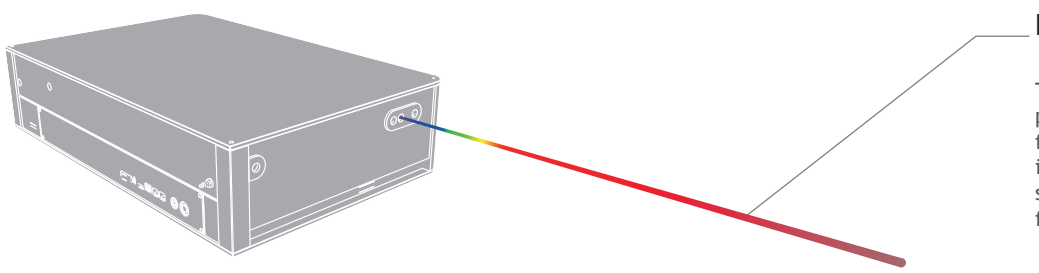
Application Examples

- Nonlinear microscopy
- Femtosecond pump probe spectroscopy
- Time-resolved spectroscopy and Photoluminescence (TR3, TRPES, TRPL)
- Photoelectron-photoion coincidence spectrometry (PEPICO)
- Coherent anti-Stokes Raman Spectroscopy (CARS)
- Two-dimensional infrared spectroscopy (2D-IR)
- Terahertz emission studies

User-Friendly by Software and Hardware Design

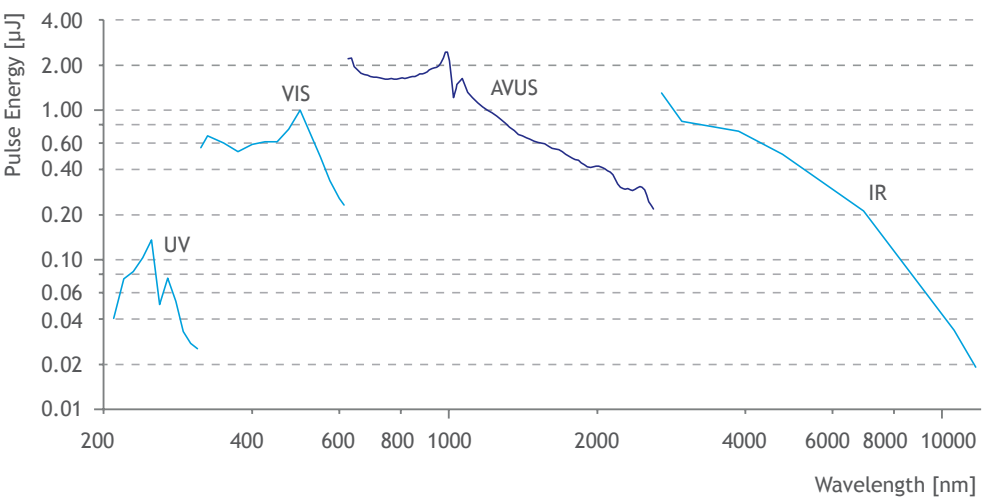
- No need for external beam routing or separation: the integrated tuning and automatic wavelength separation of the AVUS maintain the same beam position and direction for all wavelengths.



Beam Output

The same beam position and direction for all wavelengths is maintained by the software and hardware features of the AVUS.

Pulse Energy vs. Wavelength



Typical pulse energy vs. wavelength, including UV/VIS and IR extension (pumped with 40 µJ pump laser at 1 MHz repetition rate)

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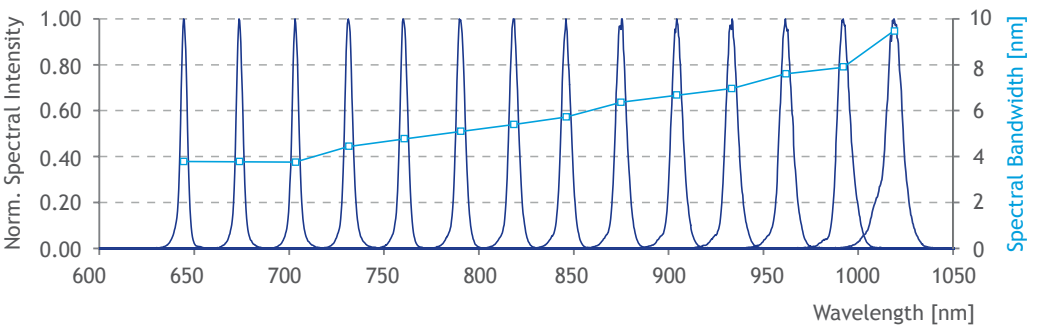
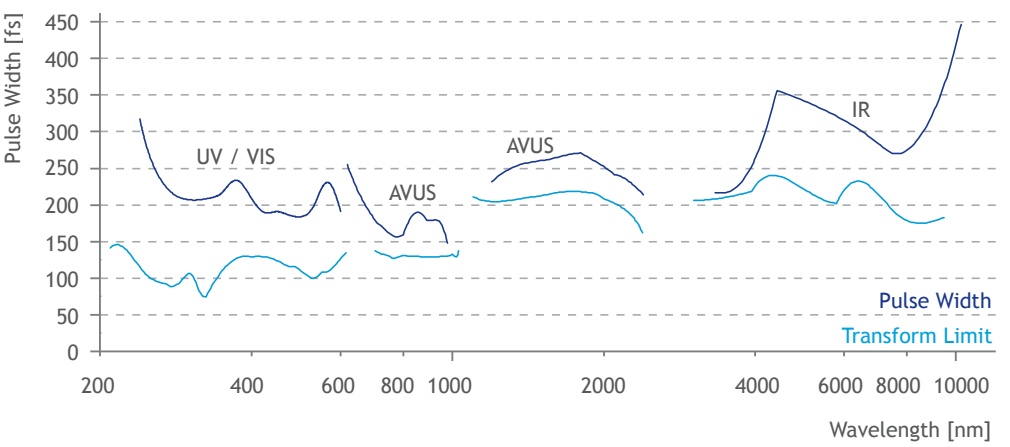
AVUS Output Spectra



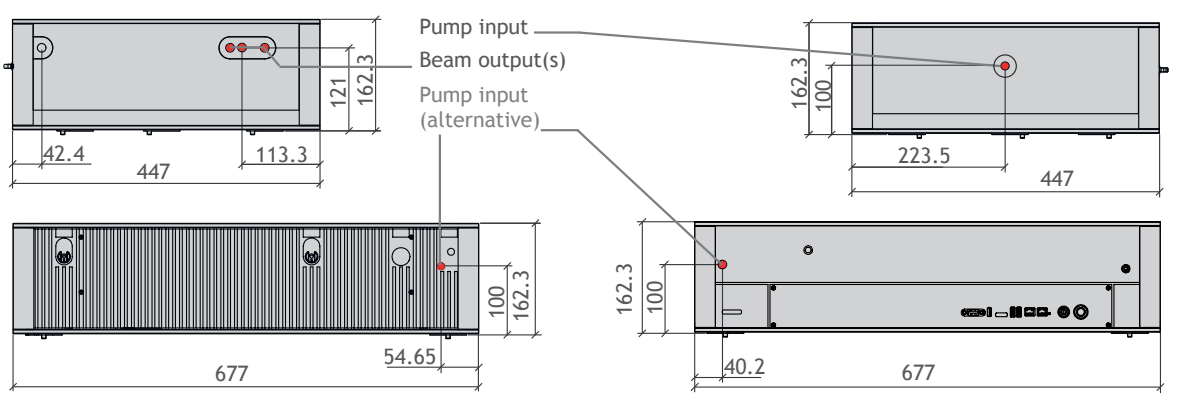
Typical output spectra and corresponding bandwidths (pumped with 40 µJ pump laser at 1 MHz repetition rate)

Pulse Duration and Transform Limits



Typical pulse widths (assuming $sech^2$ pulse shape) and their corresponding transform limits of AVUS including extensions (pumped with 40 µJ pump laser at 1 MHz repetition rate)

Dimensions



AVUS Specifications

Pump Laser Parameters

Input Laser Type	fs based laser systems
Input Power	Up to 50 W
Input Energy	8 ... 200 µJ
Input Center Wavelength	1020 ... 1070 nm
Input Polarization	Any orientation, linear
Repetition Rate	Up to 1 MHz
Pulse Width	200 ... 400 fs, others on request

Main Specifications

Conversion Efficiency at Peak	12 %, Signal + Idler; measured at 35 W input power
Time Bandwidth Product	< 1
Pulse Width	Typically 200 fs, others on request
Output Bandwidth	70 ... 120 cm^{-1} (typical)
Polarization	AVUS incl. UV/VIS extension: horizontal; IR extension: vertical
Performance Monitoring	Integrated 24/7 monitoring and data logging of both pump laser and OPA condition (e.g. beam position / pointing, repetition rate, pulse energy)
Wavelength Calibration	Factory calibrated, ± 2 nm at 650 - 950 nm
Beam Routing and Separation	Integrated, fully automated
Mechanical Design	Monolithic
Cooling	Air-Cooled
Software, PC, and Automation	Included (Embedded PC)
Remote Control	Possible via TCP/IP (SCPI command set), Windows Remote Desktop

Tuning Range

Base Unit	630 ... 1020 nm, 1040 ... 2600 nm
UV / VIS Extension (optional)	210 ... 255 nm, 260 ... 510 nm, 520 ... 630 nm
IR Extension (optional)	Up to 11 µm

Dimensions and Power

Dimensions	677 mm x 163 mm x 447 mm (See drawings for details; Dimensions may vary depending on options)
Power	100 ... 240 V, 50 ... 60 Hz, max. 100 W

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