

# 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  $\mu\text{m}$  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  $\mu\text{m}$  pump laser
- 50 W maximum pumping power
- Air-cooling and monolithic case for long-term temperature stability
- Tunable from 210 nm ... 11  $\mu\text{m}$  (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

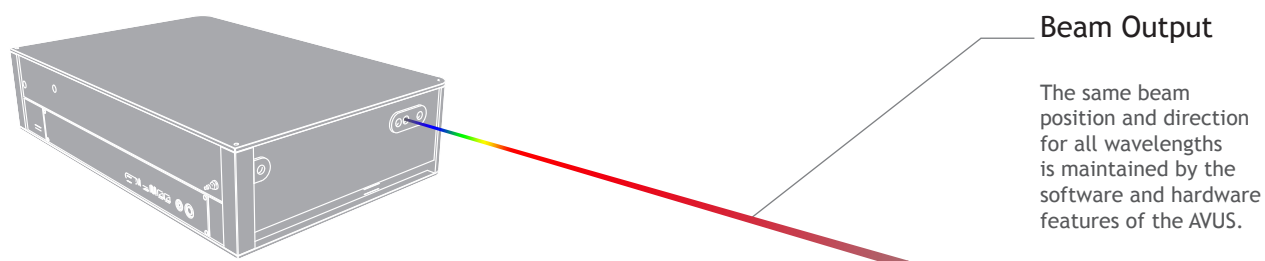
# AVUS Optical Parametric Amplifier

## Application Examples

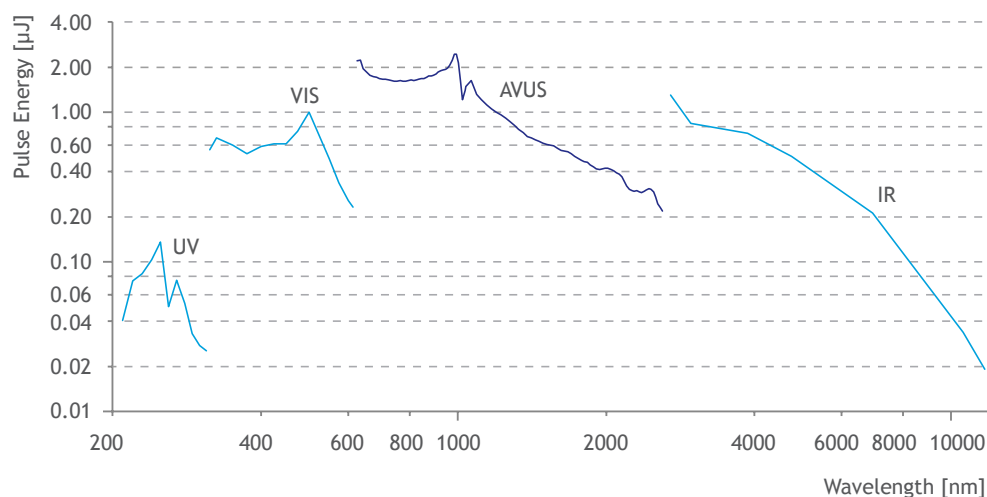
- Nonlinear microscopy
- Femtosecond pump probe spectroscopy
- Time-resolved spectroscopy and Photoluminescence (TR3, TRPES, TRPL)
- Photoelectron-photoion coincidence spectrometry (PEPICO)
- Coherent anti-Stokes Raman Spectroscopy (CARS)
- Two-dimensional infrared spectroscopy (2D-IR)
- Terahertz emission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



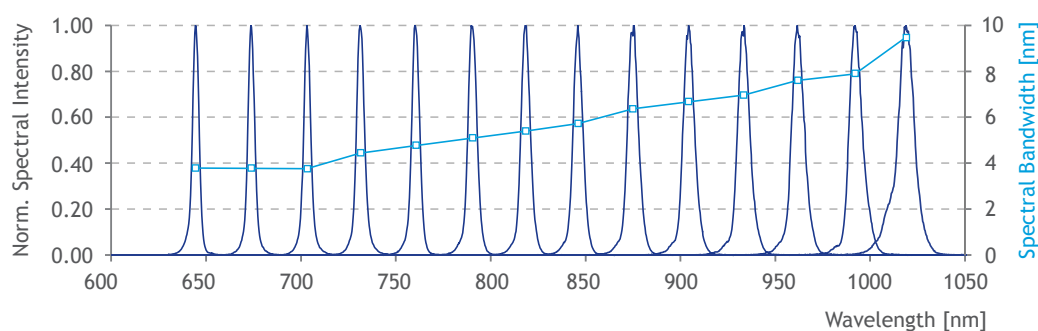
## Pulse Energy vs. Wavelength



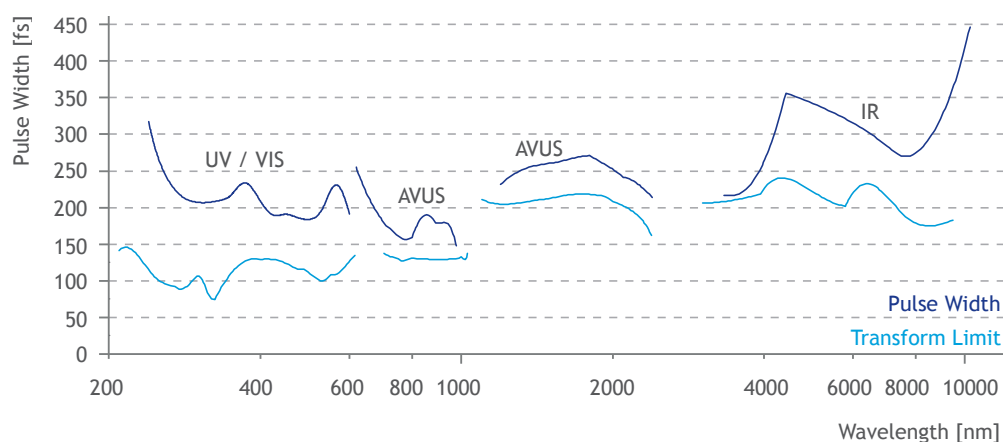
Typical pulse energy vs. wavelength, including UV/VIS and IR extension (pumped with 40 μJ pump laser at 1 MHz repetition rate)

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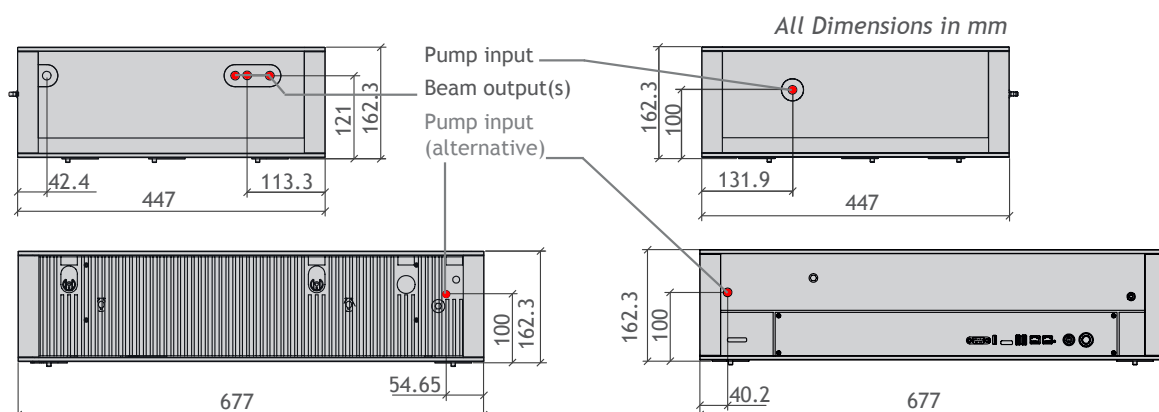
## AVUS Output Spectra



## Pulse Duration and Transform Limits



## Dimensions



# AVUS Specifications

## Pump Laser Parameters

Input Laser Type	fs based laser systems
Input Power	Up to 50 W
Input Energy	8 ... 200 $\mu$ J
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 $\text{cm}^{-1}$ (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, $\pm 2$ 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 $\mu$ m

## 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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APE follows a policy of continued product improvement. Therefore, specifications are subject to change without notice.

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