STUTTGART INSTRUMENTS
INFRARED LASERS

Piano

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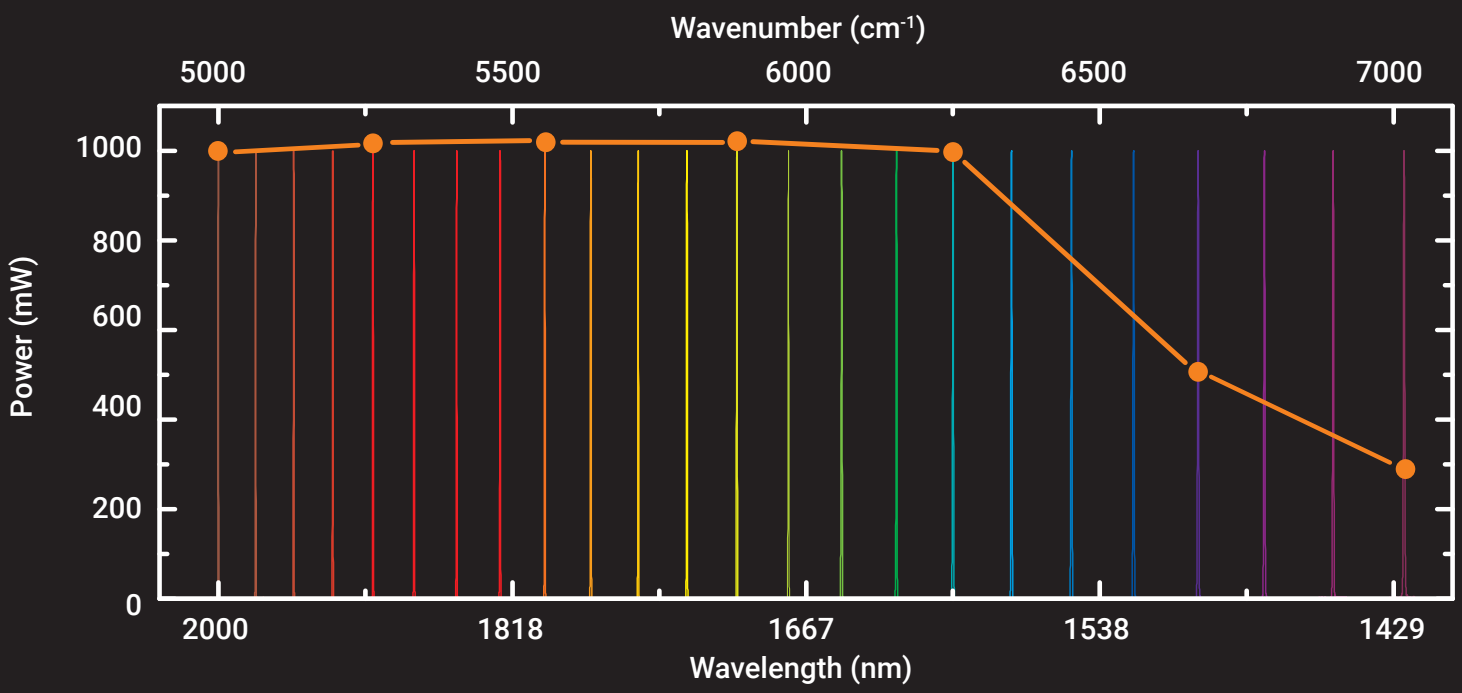
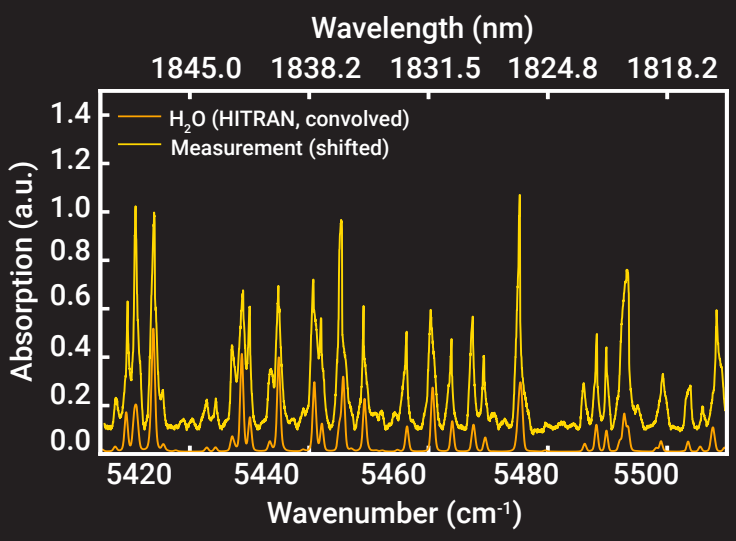
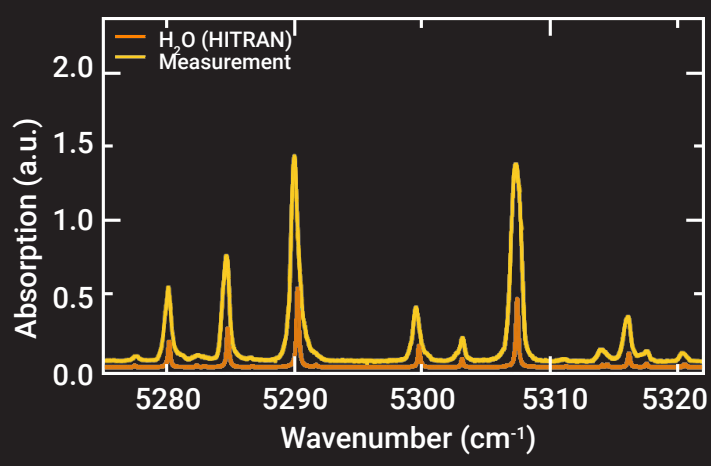
The Stuttgart Instruments Piano is an ultra compact and rapidly tunable, narrowband laser, designed for imaging applications and IR spectroscopy in industry and research. Within the spectral range from 2450 - 6900 cm^{-1} (1.45 - 4.1 µm) nearly 1 W average output power is provided; withing the MIR range from 625 - 2450 cm^{-1} (4.1 - 16 µm) several tens of mW. The SI Piano is integrated into a solid water-cooled CNC-cut housing. Dry air or nitrogen purging is available to remove atmospheric absorption. The output can be swept at ~200 cm^{-1}/s with a tuning settling time of ~1 ms. Random wavelengths are accessible within ~5 s. Scanning over the 950 - 2250 cm^{-1} (4.5 - 10.5 µm) range requires ~2 s.



Typical signal tuning range with exemplary spectra and output power of the Piano.



Atmospheric absorption analysis using IR transmission spectroscopy. This spectrum was acquired in 1s with 2 cm^{-1} resolution.



High resolution (1 cm^{-1}) and high sensitivity photoacoustic measurement of atmospheric water vapor resonances (yellow). HITRAN database reference spectrum (orange).

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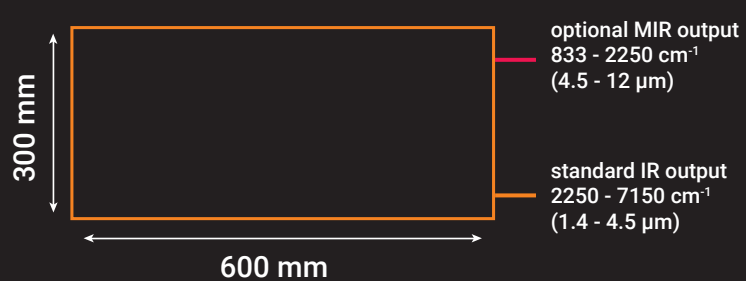
Specifications

Tuning range	1.45 - 4.1 µm (2450 - 6900 cm^{1})
with MIR	4.1 - 16 µm (625 - 2450 cm^{-1})
Typical output power	
at 1600 nm (6250 cm^{-1})	~ 800 mW
at 10 µm (1000 cm^{-1})	~ 5 mW
Bandwidth (FWHM)	< 4 cm^{-1}
Pulse duration	< 10 ps
Repetition rate (typical)	~ 50 MHz
Beam pointing	< 10 µrad
Beam quality M^2	< 1.5
Sweeping speed	~ 200 cm^{-1}/s
Tuning settling time	~ 1 ms

Footprint



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