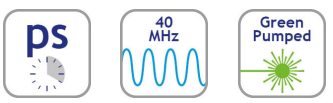
picoEmerald FT
UV to MIR, picosecond Generation

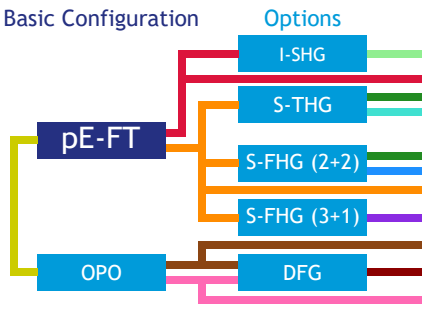
Overview



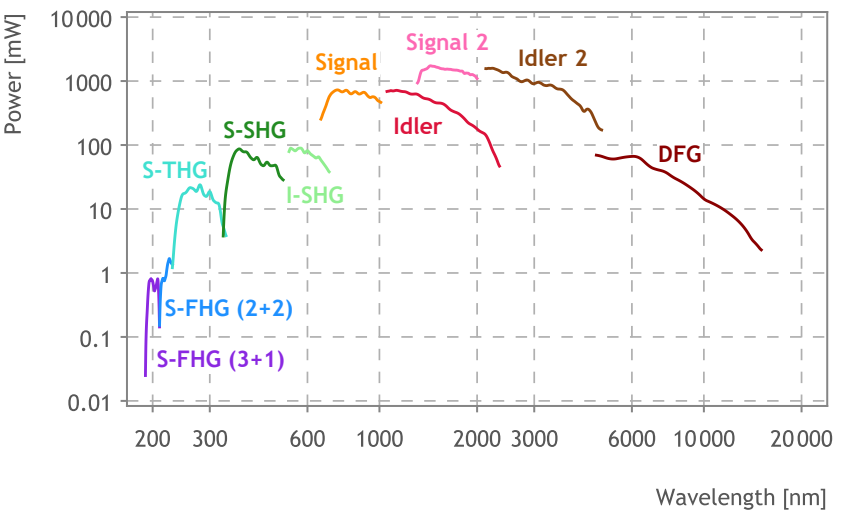
The picoEmerald FT is our flagship one-box light source. Designed for best-in-class SRS imaging quality and tuning speed, it is an easy-to-use, push-button-tunable picosecond OPO with an integrated pump laser. It directly generates 2 ps pulses with a 10 cm^{-1} bandwidth, tunable from 660 nm to 2300 nm, with an optional 1032 nm output for coherent Raman microscopy.

The light source can be further extended with harmonic generators down to 190 nm with the 4th harmonic for applications such as ARPES and metrology. Additional OPO and DFG stages, extending the wavelength range up to 15 µm enable nonlinear IR-imaging, for example in BonFIRE experiments.

Example Configuration



Typical Tuning Curve



At a Glance

- 2 ps pulses and 10 cm^{-1} bandwidth
- Fast wavelength tuning: 1.5 s for any tuning step
- Shot-noise-limited performance
- Power and delay control with active stabilization
- Perfectly synchronized output pulses, overlapped in space and time
- Integrated spectrometer
- Fully computer-controlled (TCP/IP) with automated wavelength tuning

Applications

- Coherent Raman microscopy (CARS, SRS)
- BonFIRE (bond-selective fluorescence imaging)
- Fluorescence lifetime imaging (FLIM)
- Time-correlated single-photon counting (TCSPC)
- Quantum dot research
- Metrology

picoEmerald FT
Specifications

	Signal FHG (3+1)	Signal FHG (2+2)	Signal THG	Signal SHG	Idler SHG	pico-Emerald FT Signal	pico-Emerald FT Idler	Levante IR ps Signal	Levante IR ps Idler	DFG
Wavelength range	190 nm … 210 nm	210 nm … 230 nm	230 nm … 335 nm	330 nm … 505 nm	530 nm … 660 nm	660 nm … 1010 nm	1055 nm … 2340 nm	1310 nm … 2000 nm	2150 nm … 4800 nm	4.8 µm … >15 µm
Power	0.4 mW at 200 nm	0.5 mW at 220 nm	15 mW at 266 nm	50 mW at 400 nm	40 mW at 625 nm	600 mW at 800 nm	400 mW at 1250 nm	1400 mW at 1500 nm	650 mW at 2500 nm	50 mW at 6 µm
Bandwidth (FWHM)	10 cm^{-1}									
Pulse width (FWHM)	2 ps									
Time-Bandwidth product	0.6									
Repetition rate	40 MHz									
Output polarization	Horizontal			Vertical		Horizontal				
Power stability (RMS)*	0.5%									
Spectral stability (RMS)*	0.01%									
Shot-Noise limited**	-162 dBc/Hz, >5 MHz					typ. -158 dBc/Hz, >1 MHz				

* At the specified wavelength for power measurement, expressed as normalized root mean square deviation (NRMSD), with power lock enabled, under stable environmental conditions.
** -162 dBc - limit of the measurement setup used

APE Angewandte Physik und Elektronik GmbH

Plauener Str. 163-165|Haus N|13053 Berlin|Germany
T: +49 30 986 011-30 F: +49 30 986 011-333
E: sales@ape-berlin.de www.ape-berlin.de