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Photon etc
A spectrum of solutions

海纳光学

LIMA™
HYPERSPECTRAL MICROSCOPE WITH TUNABLE EXCITATION

LIMA™ is a hyperspectral microscope based on a widely tunable laser source. It uses Photon etc.'s filtering technology to illuminate the full field-of-view of a research-grade microscope with a continuously tunable monochromatic, high power density laser light. The system provides a high spectral resolution in the VIS, NIR, and SWIR combined to a near-diffraction-limited spatial resolution. Ideal for darkfield, PLE or standard brightfield reflectance and transmittance imaging, it can map the full spectral response of a sample much faster than point-by-point or line-scan-based systems.

TECHNICAL SPECIFICATIONS

	VIS - SWIR MODEL		eSWIR
	400 - 1620 nm		
	VIS	SWIR	
Excitation spectral range	400 - 1000 nm	900 - 1620 nm	1000 - 2500 nm
Excitation spectral resolution (FWHM)	1.5 - 2.5 nm	3.0 - 5.0 nm	< 5.0 nm
Excitation wavelength	Continuously tunable		
Out-of-band rejection	< -60dB @ ±40nm	< -60dB @ ±80nm	< -60dB @ ±80nm
TLS output power	2 to 4 mW	3 to 9 mW	0.5 to 8 mW
Illumination	High efficiency homogeneous illumination		
	Dia or Epi illumination; Brightfield; Darkfield (Oil and Dry)		
Spatial resolution	Sub-micron - limited by the microscope objective NA		
Camera	sCMOS (optionally CCD, EMCCD)	Photon etc. InGaAs camera (ZephIR™ 1.7 or Alizé™ 1.7)	Photon etc. HgCdTe camera (ZephIR™ 2.5)
Microscope	Upright or inverted, scientific grade		
Wavelength absolute accuracy	FWHM/8		
Scanning speed	20 to 50ms stabilization time (for step sizes 0.01 to 10 nm)		
X, Y travel range	76 mm x 52 mm (with a manual stage)		
Z stage resolution	100 nm		
White light illumination	Diascopic, episcopic, Hg, halogen		
Preprocessing	Spatial filtering, statistical tools, spectrum extraction, data normalization, spectral calibration, overlay, central position map, etc.		
Hyperspectral data format	HDF5, FITS		
Software	PC (Windows10 - 64-bits) with PHySpec™ control and analysis software (computer included)		
Dimensions**	Microscope: 31 cm x 85 cm x 82 cm Supercontinuum laser: Up to 44 cm x 25.1 cm x 40 cm Tunable filter: Up to 30 cm x 23 cm x17.5 cm		
	Combined: Less than 105 cm x 85 cm x 82 cm		
Weight	≈ 80 Kg (Gross 220 lbs ; Net 180 lbs)		
Power requirement	120 VAC / 12 A / 60 Hz 230 VAC / 12 A / 50 Hz		

OPTIONS & ACCESSORIES

	Objectives magnifcation: 20X, 40X, 50X, 60X, 100X (5X and 10X available on demand)
	Motorized stage: 100 mm x 100 mm travel, 22 nm resolution
	Filter wheel: up to 6 band-pass filters
	Second camera port
	High resolution module: VIS < 0.5nm ; SWIR < 1.0nm
	Hyperspectral filter in detection (2D spectroscopic micro-imaging)
	Polarization control (polarizer & analyser)
	** Optical table with passive anti-vibration isolation recommended: 900 x 1800 x 60 mm (36 x 72 x 2.4 inches) or 900 x 900 x 60 mm (36 x 36 x 2.4 inches) next to 900 x 900 mm (36 x 36 inches) standard table

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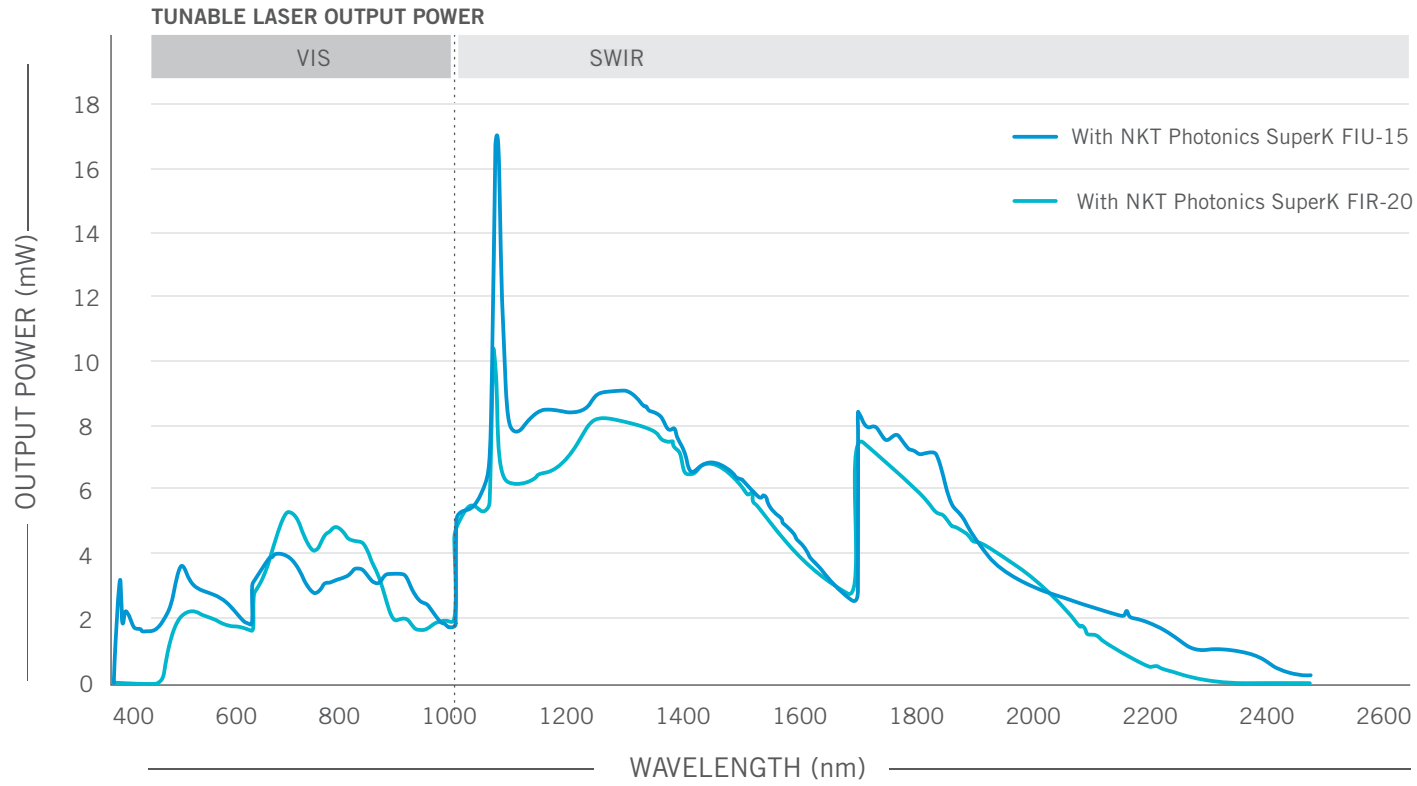
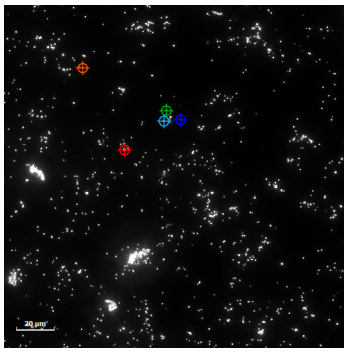


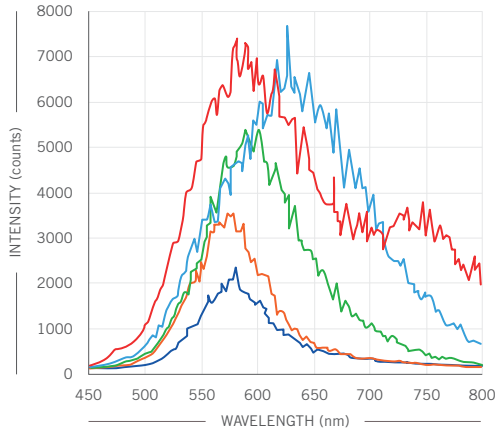
APPLICATIONS

DARKFIELD HYPERSPECTRAL MICROSCOPY

Not only the LIMA can rapidly localize nanoparticles in a sample but the acquisition of the scattering spectrum offers much more insight into the nature of the sample. For example, the intensity and position of the scattering peak help to identify the size and shape of each nanoparticle.

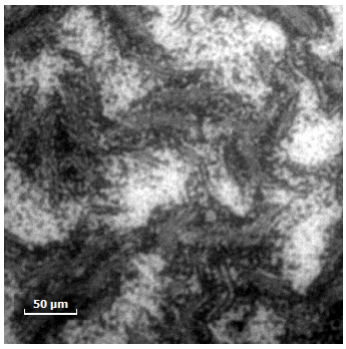


Darkfeld hyperspectral image of 100 nm gold nanoparticles using a 40X dry objective

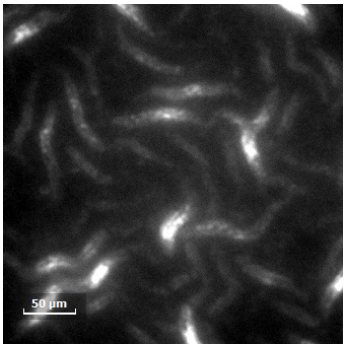


PHOTOLUMINESCENCE EXCITATION AND REFLECTANCE MAPPING

Photoluminescence Excitation (PLE) and Reflectance hyperspectral data of perovskite films acquired over the same field of view. The combination of those optical measurements can guide fabrication methods by helping the identification of defects, inhomogeneities, and losses.



Reflectance



Integrated PL (750 to 1000nm) with 550 nm excitation