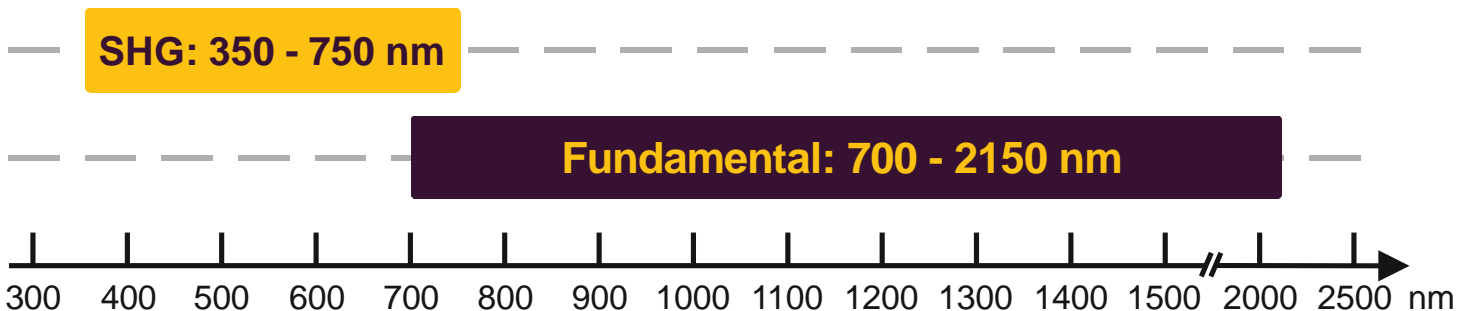
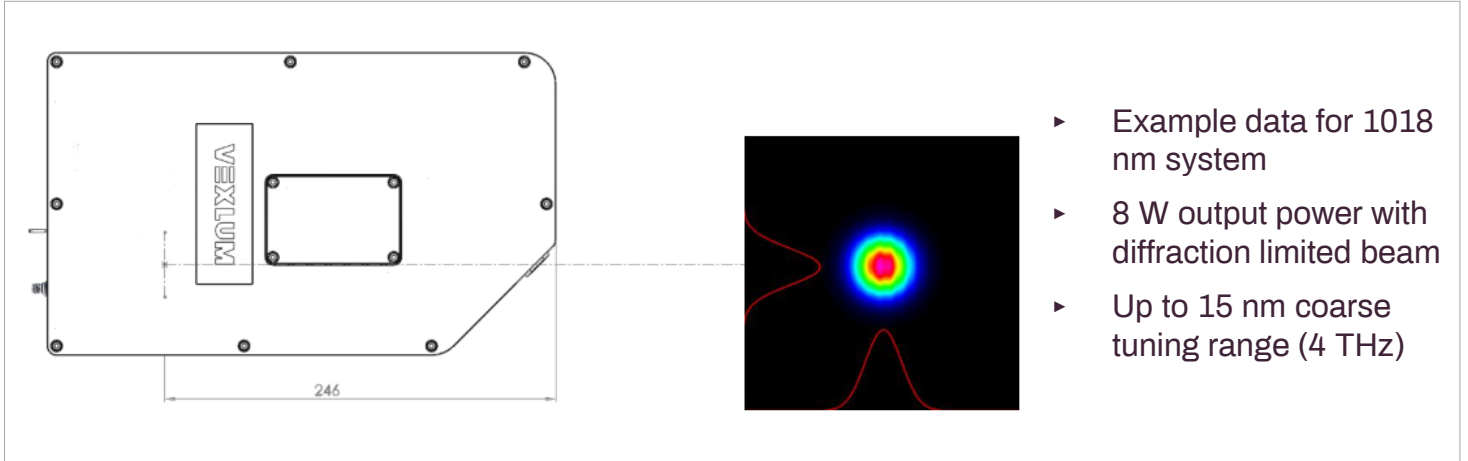


- ▶ VECSEL system for quantum technology (Vertical-External-Cavity Surface-Emitting Laser)
- ▶ Broad wavelength coverage at near infrared
- ▶ Single-frequency
- ▶ Tunable (up to 10 THz with a single system)
- ▶ Excellent beam quality

Wavelength	700 – 2150 nm (target wavelength selection range)
CW power, free-space, with integrated pump	700 – 900 nm: up to 1 W 900 – 1200 nm: up to 8 W, up to 12 W with external pump 1200 – 1600 nm: up to 3 W 1600 – 2150 nm: up to 2 W
Coarse tuning (typical)	up to 10 THz around the target wavelength
Mode-hop free tuning (typical)	> 1 GHz (cavity free spectral range)
Free-running linewidth	< 10 kHz (100 μs), < 100 kHz (10 ms)
Beam quality (typical)	$M^2 < 1.1$ TEM ₀₀
Frequency locking	Two cavity piezos, RF-SMA interface Intracavity etalon EOM (patent pending), RF-SMA interface
VECSEL head size	320 mm x 190 mm x 100 mm (L x W x H)
System includes	VECSEL head with pump laser VALO Control Unit for CW operation, 19"-rack installable Low vibration chiller (water-to-air or water-to-water), 19"-rack installable
System excludes	Frequency locking electronics and actuator voltage source Optical isolator (35 dB single-stage isolation recommended) Fiber coupling (typical single-mode fiber coupling efficiency 70 – 90 %)



VALO SF SINGLE-FREQUENCY NIR VECSEL



- ▶ Example data for 1018 nm system
- ▶ 8 W output power with diffraction limited beam
- ▶ Up to 15 nm coarse tuning range (4 THz)

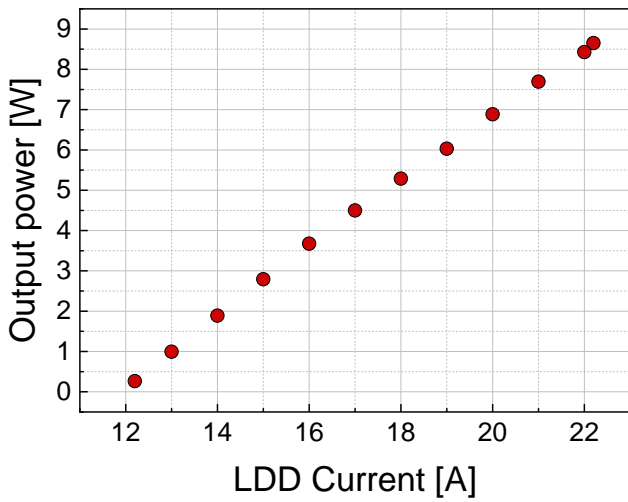


Figure 1. 1018 nm output power vs pump current

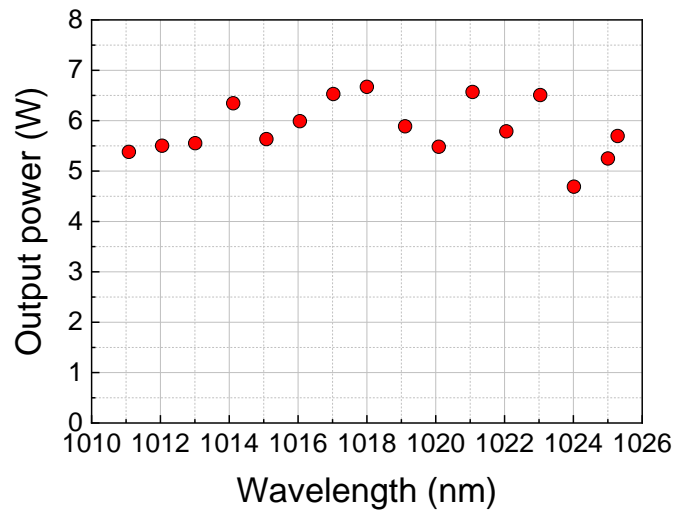


Figure 2. Tuning with birefringent filter rotation

