SUPERLIGHT PHOTONICS

SUPERCONTINUUM LASER REVOLUTIONIZES OCT

Breakthrough in wide-spectrum/low-noise lasers for OCT in industrial quality inspection

superlightphotonics.com

OCT

Optical Coherence Tomography is a non-invasive, non-destructive method for sub-surface analysis. In the medical field, it is used to examine eyes, skin, and arteries. Increasingly, OCT is also gaining traction in the industrial sector for in-line and at-line inspection of multi-layered materials such as composites, polymers, ceramics, and opto-semiconductors.

Lightsources ASE or SCG?

A significant number of OCT systems rely on ASE (Amplified Spontaneous Emission) light sources, such as SLED, which offers great efficiencies coupling into fiber compared to halogen or LED, but also present notable challenges: limited spectral range, which negatively impacts the axial resolution of OCT systems. To overcome this limitation, multiple ASEs are combined in a single package, which increases cost and complexity.

Wideband lasers to the rescue

Traditional wideband or supercontinuum lasers offer a wider spectrum, resulting in a high axial resolution in the OCT system, but typically come in a large form factor and require Class IV laser safety precautions which are not practical outside a lab and in a manufacturing environment. Both ASE and traditional supercontinuum lasers suffer from spectral noise which results in low contrast OCT scans.

Breakthrough in wide-spectrum/low-noise lasers High resolution & high contrast OCT for industrial, medical, and science applications

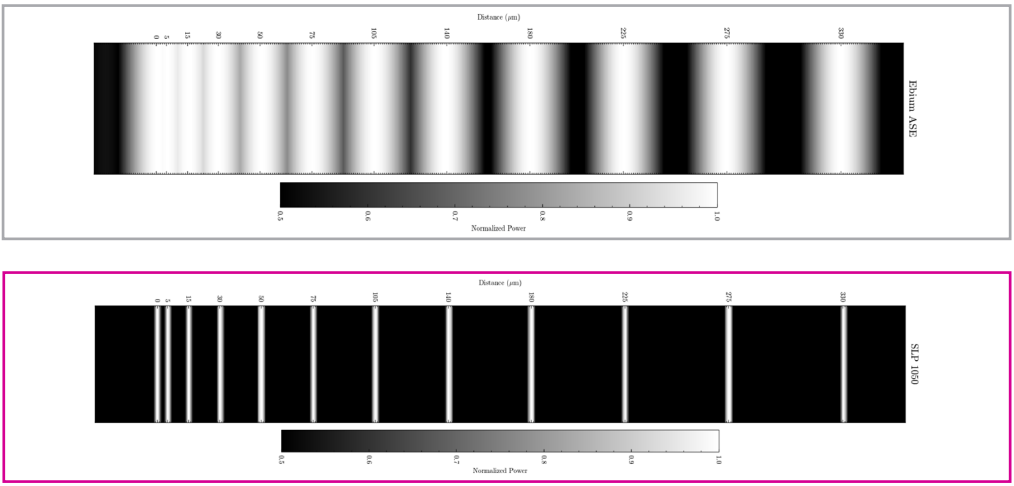
The SLP-1050 has it all

- Replacement for ASE (such as SLED) & traditional supercontinuum light sources
- Patented PAD – Patterned Alternating Dispersion ™
- Exceptional 3 orders of magnitude lower noise vs. other supercontinuum sources
- 2.75 µm axial resolution, broad spectral range in Extended SWIR
- Class IIIb laser, significantly reducing laser safety precautions
- Compact form factor, highly versatile across industries and applications
- High speed in-line and at-line quality inspection

OCT Measurements

To demonstrate the meaning of wide-band and low-noise performance, we benchmarked the SLP-1050 against an ASE light source. The results show a significant improvement in resolution and contrast, revealing additional layers and facilitating data processing.

Comparison of axial resolution in OCT



Comparison of axial resolution in OCT using FWHM measurements of stepped mirrors positions.

Top — ASE source shows broad, overlapping lines at finer steps.

Bottom — SLP-1050 supercontinuum source results in sharper lines, demonstrating significantly improved resolution.

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SLP-1050

Light source in

OCT

Optical Coherence Tomography

For non-contacting, non-destructive, high resolution sub-surface analysis

SuperLight Photonics wideband lasers offer **tremendous visual depth** & **bandwidth** in OCT

Alternative to ASE sources, such as SLED

Offers substantial higher resolution and contrast

Industrial: non-destructive testing of ceramics, composites, polymers, opto-semi

Medical and science: oculometry, skin, arteries, organs
Artwork restoration and forensics

Our products ☛ www.superlightphotonics.com

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