SureBlock™ XLF Series THz-Raman Filter Systems

SureBlock™ XLF-CLM

SureBlock™ XLF-C

SureBlock™ XLF

Features:

All XLF Systems

- Fast collection of ultra-low-frequency / THz-Raman spectra
- High Optical Density (> OD8) with extremely high throughput*
- Ultra-compact footprint, plug-and-play operation, configurable sample & output ports
- Compatible with most commercial spectrometers, microscopes and Raman systems
- Available at 488nm, 514nm, 532nm, 633nm and 785nm. Custom wavelengths by request

* Throughput varies with wavelengths

XLF-C

- Confocal design, integrated ASE filtering, compatible with Ondax SureLock™ lasers and commercial DPSS and gas lasers

XLF-CLM

- Turn-key confocal platform with integrated laser module
- Configurable sample port options: Collimated beam, Cuvette holder or integrated microscope adapter

Applications:

- Polymorphic structure identification
- Structural studies of nano- and bio-materials
- Trace detection of explosives/hazmat/drugs
- Forensics studies
- Geological specimen analysis and gemology

Ondax's patented[1] SureBlock™ XLF Series THz-Raman™ Systems enable fast, clear capture of Raman spectra in the Ultra-Low-Frequency/THz regime (10 cm^{-1} to 200 cm^{-1}, or 300 GHz to 6 THz), using only a standard single-stage spectrometer. THz-Raman is powerful new technique for molecular structure analysis that is both simple and compact when compared to multi-stage or THz spectrometers, and represents a dramatic shift in the economics, efficiency, and ease of use of Raman spectroscopy.

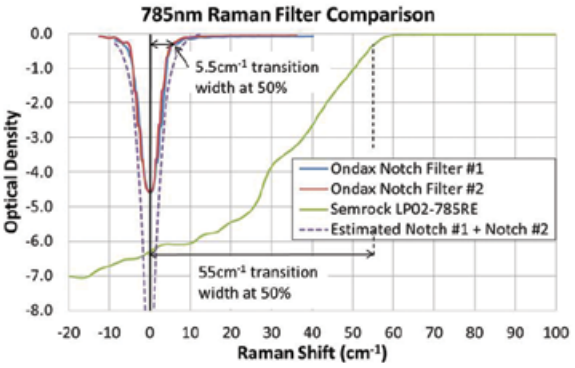
The unique ultra-narrow band design of our patented[2] SureBlock™ Notch Filters also delivers exceptionally high throughput of both Stokes and anti-Stokes shifts up to >5000cm^{-1} (>150 THz). This allows observation of low-frequency vibrational/phonon modes, differentiation of polymorphs and other structural characteristics of pharmaceuticals, nano- and bio-materials, trace detection of explosives, and characterization of petroleum products, heavy metals, and geological samples.

The XLF Series platforms are ultra-compact and include configurations to match any requirement. The base **XLF** model is an integrated, pre-aligned, light-tight, double-notch system with selectable fiber- or free-space input and outputs, adaptable for use with any single-stage spectrometer. The **XLF-C** is a confocal design, which includes ASE reduction, configurable sample and output ports, and plug-and-play compatibility with our SureLock™ single frequency laser modules (as well as single-frequency DPSS, Argon ion, or HeNe laser sources). The **XLF-CLM** is a fully integrated confocal Raman spectroscopy front-end, which includes a 785nm or 532nm single-frequency laser source module, with optional cuvette holder or microscope objective, or can be directly integrated with existing Raman workstations and micro-Raman systems. Complete turnkey systems, including fully configured spectrometers, are also available.

All XLF systems provide > OD 8 Rayleigh suppression, and are engineered for fast, flexible integration with a wide variety of existing commercial spectrometers microscopes, and Raman systems. Available at standard Raman wavelengths including: 488nm, 514nm, 532nm, 633nm, and 785nm, these compact, robust plug-and-play systems deliver incredible speed, resolution and ease of use, all at an extremely affordable price!

Ultra-narrow band notch performance

The dual-notch configuration of all XLF Series platforms delivers > OD 8 Rayleigh Suppression while maintaining an extremely low ~5cm^{-1} transition width (at 50% transmission) – a full order of magnitude narrower than conventional thin-film notch filters.



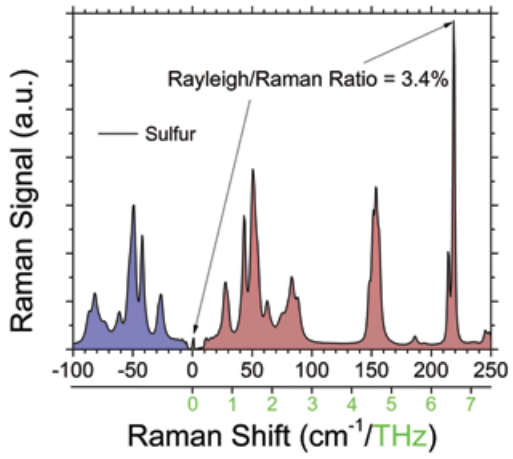
[1] *Patent # 8,184,285*
[2] *Patent #7,986,407*

SureBlock™

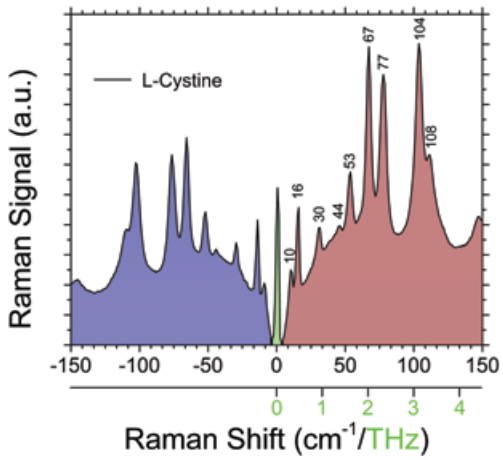
Exceptional Ultra-Low-Frequency/THz-Raman Performance

The XLF platform extends the reach of Raman systems into the spectral regime where important structural details, including lattice or polymer structures, crystal orientation, spin waves, and phonon modes can be discerned. The high optical density, ultra-narrow band, high-throughput design virtually eliminates the Rayleigh signal while enabling rapid collection of low-frequency/THz-Raman spectra.

The examples below show spectra in the ~10-200cm^{-1}, or 300GHz-6THz regimes, using two different excitation wavelengths. For strong Raman scatterers such as Sulfur (left), the ratio of Rayleigh peak to signal peak is an exceptionally low 3.4%. For weaker scatterers, like L-Cystine (right), the narrow bandwidth produces clearly differentiated signals down to <10cm^{-1}. Both examples also demonstrate the simultaneous capture of anti-Stokes signals.

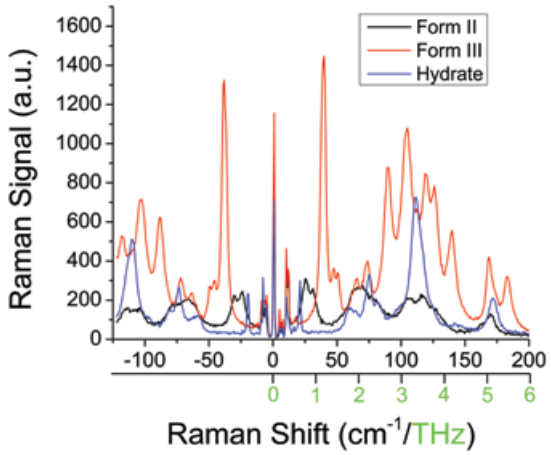


Sulfur spectrum taken at 785nm

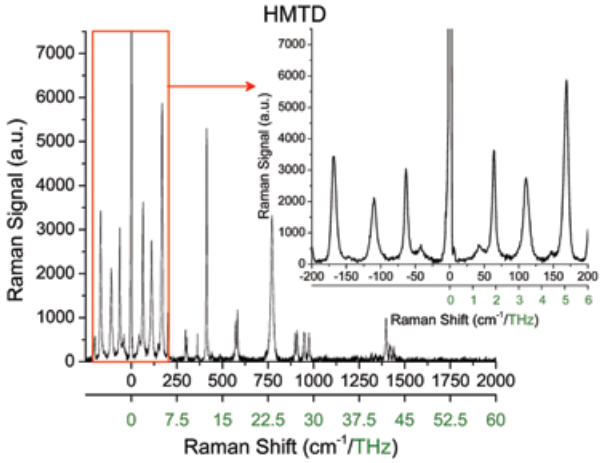


L-Cystine spectrum taken at 532nm

The clean, distinct signals from the XLF can be used to clearly differentiate between phases of polymorphic structures and obtain molecular structural information via their vibrational/phonon modes. Carbamazepine (left) exhibits clearly unique low-frequency spectra depending on the polymorphic form (Form 2, 3, and hydrate as shown). Many explosive ingredients, such as TATP and HMTD also exhibit strong low-frequency signals (right).



Polymorphic forms of Carbamazepine can be easily distinguished



Low frequency spectra of explosive agents show THz-Raman spectra with signal strengths similar to higher frequency spectra, enabling clear trace detection

Ordering Information

Sureblock XLF-λλλ.λ - AA - BB

λ: Wavelength (nm)
AA: Input option[1]
BB: Output Option[2]
[1] FS=Free Space, FC = FC/PC, SM = SMA, AP = FC/APC
[2] FS=Free Space, OB = Objective, CV = Cuvette Holder

Sureblock XLF-C-λλλ.λ - AA - BB

λ: Wavelength (nm)
AA: Output option[1]
BB: Sample Port Option[2]
[1] FS=Free Space, FC = FC/PC, SM = SMA, AP = FC/APC
[2] FS=Free Space, OB = Objective, CV = Cuvette Holder

Sureblock XLF-CLM-λλλ.λ - AA - BB

λ: Wavelength (nm)
AA: Output option[1]
BB: Sample Port Option[2]
[1] FS=Free Space, FC = FC/PC, SM = SMA, AP = FC/APC
[2] FS=Free Space, OB = Objective, CV = Cuvette Holder

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