

# MEASURING VOLUME SCATTERING FUNCTION

Sequoia Scientific, Inc. manufactures the LISST series instruments. The primary measurement in is the Volume Scattering Function. The instruments also measure optical transmission with very low acceptance angles, which yields superior beam attenuation coefficient,  $c$ .



## LISST-200X: Measures Small-angle VSF - from 0.04 – 11.5°, and Beam Attenuation.

This instrument replaces the original LISST-100X. It measures the VSF at 36 log-spaced angles. The beam attenuation measurement has an acceptance angle of just 0.018°. Operating range  $c > 0.8 \text{ m}^{-1}$ . Max. operating depth: 600m.

[Agrawal YC, Mikkelsen OA (2009): Empirical forward scattering phase functions from 0.08 to 16 deg. for randomly shaped terrigenous 1-21  $\mu\text{m}$  sediment grains. Optics Express 17:8805–8814.]



## LISST-DEEP: 3000 m Depth Rating

Similar to LISST-200X, it covers angles in water from 0.04 – 6.06°. Beam attenuation has identical acceptance angle as for LISST-200X above, 0.018°. Operating range:  $c > 0.4 \text{ m}^{-1}$ . Suitable for shelf or deep water. Caution: best to use in higher attenuation environments (contact us for details).



## LISST-VSF: Covers 0.1 – 150°, and Beam Attenuation

Uses green 514nm laser and optics similar to LISST-200X for small-angle forward VSF. Covers 0.1 to 14.3° in log-spaced angles, and remaining angles in 1° intervals. Also obtains depolarization  $P_{12}$ . Beam attenuation acceptance angle: 0.043°. Operating range:  $0.1 < c < 8 \text{ m}^{-1}$ .

[Slade, W. et al., 2013: Comparison of Measured and Theoretical Scattering and Polarization Properties of Narrow Size Range Irregular Sediment Particles; Ocean Optics.]