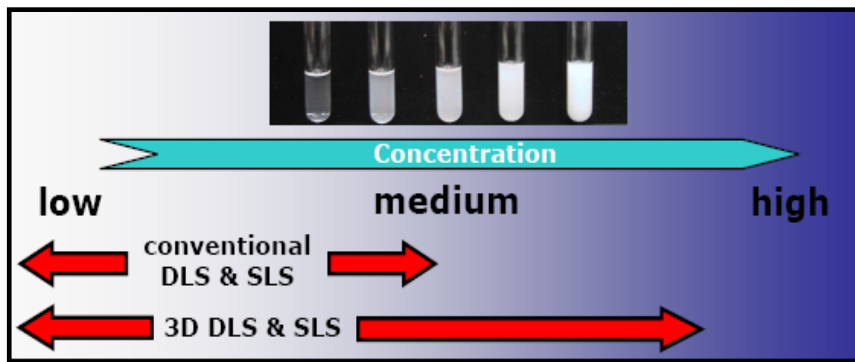




3D DLS Spectrometer

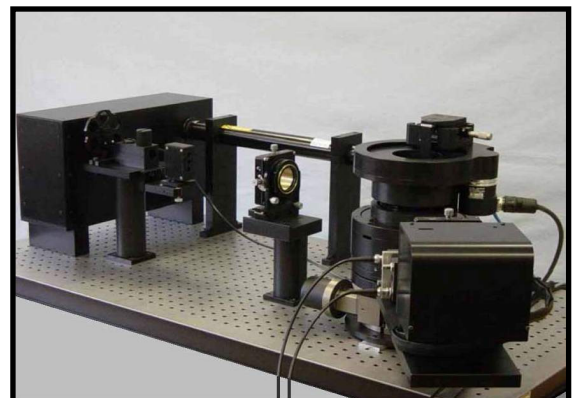
The 3D DLS Spectrometer from LS Instruments is among the most sophisticated light scattering systems for static and dynamic light scattering available world wide (DLS & SLS). Based on the cross-correlation technology it is the only device on the market, which efficiently suppresses multiply scattered light. It allows all standard applications of SLS and DLS, but with the advantage of extending DLS and SLS experiments to turbid samples with high concentrations.



Typical applications include:

- Particle sizing 1 – 1000 nm (hydrodynamic radius, radius of gyration)
- Measurement of polydispersity, size distribution
- Characterization of polymers: molecular weight determination, 2nd virial coefficient
- Diffusion coefficient, mean square displacement
- Determination of form factor, structure factor
- Osmotic pressure (inter particle distance)
- Process monitoring (e.g. gelation, aggregation, ageing...)

The 3D DLS Spectrometer offers a fully modular design that allows easy replacement of individual parts and several options to configure the instrument to your specific demands. Ask the experts at LS Instruments for the optimal solution for your laboratory.



3D DLS Spectrometer

Specifications

- The goniometer setup allows DLS and SLS experiments at scattering angles from 10° - 150° , with a nominal angular resolution of 8192 steps per 1° .
- Two channel multiple tau correlator (minimum sampling time 12.5 ns, maximum lag time 8×10^4 s, 2x608 channels in cross-correlation, 1088 channels in autocorrelation).
- Laser: The standard configuration is equipped with a HeNe Laser (21mW, polarized 500:1). Many options available.
- High sensitivity APD detectors with a quantum efficiency of more than 65% at $\lambda = 632$ nm (dark counts < 250 c/s) that allow for experiments with weakly scattering or transparent samples due to their high quantum efficiency.
- Single mode fibre detection system with separate collimation optics.
- Direct on-line temperature measurement in the index matching vat via a PT-100 temperature sensor.
- Temperature controlled index matching vat for measurements at $10^\circ\text{C} < T < 70^\circ\text{C}$ (requires additional thermostat). Temperatures below approximately 15°C require purging with dry air or nitrogen in order to avoid condensation (purging facility not included, available upon request).
- Dedicated 1 inch filter holder unit (can be used e.g. to mount an interference filter to suppresses background light and possible fluorescence or Raman contribution).
- Laser safety measures include all-enclosed laser incident beam optics with guide tubes and beam shutter.
- Different cuvette holders included, which allow measurements with cylindrical cells of either 10 or 5 mm diameter or square cells with path length of 10 mm.
- The use of 5 mm round cells allows using sample volumes down to 200 μl .
- Pseudo cross-correlation mode with required fibre splitter and beam-stop included: This allows switching to DLS and SLS experiments in pseudo cross-correlation mode, in order to be able to work with very short lag times. In this way one can recover the (ideal) intercept of 1 that is advantageous for example for particle sizing in transparent solutions. The change from 3D to standard DLS can be made quickly and without any re-alignment required.
- Detailed manual and hardware tools required for the alignment of the spectrometer included.

3D DLS Spectrometer

Specifications

- Spectrometer control software for static and dynamic light scattering experiments. Upgrades of the control and analysis software package will be provided free of charge during the first 3 years after the purchase of the instrument (requires personal computer with XP or Vista, not included).
- Laser attenuation system combined with on-line incident laser intensity measurement (high precision laser power meter with computer readout). This information is read by the software for later normalization of the static light scattering data.
- The instrument should be mounted on a standard (metric or imperial) optical breadboard (minimum size 90 X 60 X 5 cm). The bread board can be obtained optionally.

Optional items (PRO-Version):

Second sample goniometer for measurements using a so-called Θ - 2Θ detection. This allows for DLS and SLS experiments with extremely turbid samples in square cells, where the optical path length in the sample can be adjusted and significantly reduced (as low as 0.2 mm). The main and sample cell goniometer can be controlled separately via the spectrometer control software. The optical path length in the sample is adjustable when rectangular cells are used. Additionally for non-ergodic systems (e.g. gels, glasses, foams) a continuous rotation of the sample can be performed.

