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Investigating dynamics in turbid media using diffusing-wave spectroscopy-based methods

An inherent problem of the interpretation of data collected using dynamic light scattering is related to multiple scattering. Diffusing-Wave Spectroscopy (DWS) exploits multiple scattering to probe the dynamics of turbid systems. In this talk, we will first introduce the basics and experimental setups used in conventional DWS. We will give examples of its uses, in monitoring the changes in the particle size of concentrated emulsions undergoing Ostwald ripennng, the kinetic of milk gelation. Secondly, we will show how DWS can be used to probe the micro-rheological behaviour of biopolymer solutions. Thirdly, we will introduce Multiple Speckle-DWS, an extension of DWS to non-ergodic and systems with very slow dynamics such as colloidal gels. Finally, experimental results on the application of DWS to investigate in-situ samples under shear and High Hydrostatic Pressure will be discussed.

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