

Direct Imaging of Non-Equilibrium Fluctuations during Free Diffusion in Nanocolloids

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Colloids are ideal systems for investigating both spatial and temporal processes using optical methods since they have particle sizes larger than the characteristic size of atomic or molecular systems. We performed direct imaging experiments in order to investigate the concentration-driven non-equilibrium fluctuations in different nanocolloidal suspensions with a range of particle sizes and at different concentrations. We used a dynamic structure factor algorithm for image processing in order to compute the structure factor and to find the power law exponents and the correlation time of these fluctuations. The spatial-temporal evolution of fluctuations was also investigated and provides insight about correlation length and lifetime of fluctuations.