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ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

ΠΑΡΟΥΣΙΑΣΗ ΜΕΤΑΠΤΥΧΙΑΚΟΥ ΔΙΠΛΩΜΑΤΟΣ ΕΙΔΙΚΕΥΣΗΣ

Τίτλος:

« Dynamics and rheology in suspensions and glasses of soft colloids »

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Abstract

Colloidal suspensions of soft particles consisting of a hard core and polymer grafted chains, with variable chain lengths have been investigated by dynamic light scattering and rheology. These particles can be used as a model system to study the fundamentals of soft particles dynamics and rheology as a function of volume fraction. Two different light scattering set-ups were used to probe the dynamics from the dilute limit up and well into the glassy state[1]. For volume fractions up to glass transition, 3D Dynamic Light scattering (3DDLS)[2] was used in order to suppress any possible multiple scattering, monitoring the relaxation of concentration fluctuations through cooperative and self-diffusion mechanisms. In glassy samples, Multispeckle Dynamic Light Scattering (MDLS)[3] was utilized to enable measurement of the proper ensemble average correlation function which allows the investigation of slow dynamics and aging effects. In both regimes cooperative and self diffusion coefficients were probed as a function of volume fraction and the effects of thermodynamics and hydrodynamics were monitored around the peak of the structure factor. Dynamic Light scattering in the glassy state was complemented by shear rheology to connect the microscopic frustration of particle motion with macroscopic liquid to solid transition.

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Ο Πρόεδρος του Τμήματος

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