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Inner dynamics in adsorbed microgels

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The physical properties of stimuli-responsive microgels and polymer brushes still attract great interest in basic research and lead to a lively discussion of potential technical applications. Prominent examples are systems, which undergo a temperature induced phase transition as the sample temperature changes.
Microgel particles can be easily organized as ultra-thin films at solid surfaces, e.g. silicon single crystal surfaces. This leads to changes in the swelling behavior and shifts the LCST with respect to the bulk phase. These findings raise the question how the interactions with the solid surface affect the inner structure and dynamics of the adsorbed microgel particles. Here, we focus on neutron spin echo spectroscopy (NSE) experiments in transmission and reflection geometry. Up to now, only few publications report NSE experiments on the inner dynamics in microgels. NSE provides access to the dynamics in the ns to ms time range on nanoscopic length scales. The microgel layers were for the first time studied by NSE under grazing incidence (GINSES) which uses evanescently scattered neutrons and therefore probes the near-surface dynamics in the adsorbed microgel films.
In particular, we discuss the inner dynamics in different types of microgels in bulk and in thin films adsorbed onto silicon surfaces.

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