Contribution ID: **1** Type: **Invited talk (30 min + 5 min discussion)**

Soft spheres at the interface probed by neutron reflectometry and interfacial rheology

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Microgels - crosslinked polymer networks swollen in a good solvent - have been used to investigate the effect of compressibility on crystal and glass formation, and on its relation with the flow proprieties of the suspensions [1]. Their compressibility strongly affects microgels at interfaces [1, 2]. Here, poly(N-isopropylacryamide) (pNIPAM)-based microgels are confined at the oil- and air-water interface and used to investigate the flow properties of soft spheres in two dimensions [3]. We use neutron reflectometry to determine the particle architecture in-situ under compression and their response to external stimuli in the water phase [4,5]. Using interfacial rheology, two different flow-regimes are identified at different microgel concentrations, leading to two different master flow-curves. Both the storage modulus and the apparent yielding stress of the monolayer show a non-monotonic variation with concentration. Furthermore, the monolayer never reaches a jammed state. Computer simulations, based on a soft shoulder plus Hertzian model, confirm the non-monotonicity of the yield stress and the existence of different flow regimes.

[1] A. Scotti, et al. Chem. Rev. 122: 11675 (2022).
[2] A. V. Petrunin, et al. PCCP 25: 2810 (2023).
[3] M. M. Schmidt, et al. PRL 131: 258202 (2023).
[4] S. Bochenek et al. Nat. Comm. 13: 3744 (2022).
[5] Y. Gerelli et al. Soft Matter 20: 3653 (2024).

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