Analysis of a sedimenting suspension near a vertical wall

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In this talk I will present a recent result regarding the analysis of a sedimenting suspension near a vertical wall. Assuming the presence of a particle depleted layer near the boundary, we show that the classical effective model can be approximated in the bulk region by the solution to a Stokes equation with a wall law of Navier type. The rigorous justification of the homogenized model is obtained by considering Stokeslets on the half-space whereas the computation of the fluid expansion in the bulk region is based on boundary layer analysis.
I will discuss the link between the obtained effective model and two phenomena that can be found in several references: the appparent slip and the intrinsic convection. This is a joint work with David Gérard-Varet.