Global BMO estimates for non-Newtonian fluids with perfect slip boundary conditions

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Abstract

We study the generalized stationary Stokes system in a bounded domain in the plane equipped with perfect slip boundary conditions. We show natural stability results in oscillatory spaces, i.e. Holder spaces and Campanato spaces including the border-line spaces of bounded mean oscillations (BMO) and vanishing mean oscillations (VMO). In particular, we show that under appropriate assumptions gradients of solutions are globally continuous. Since the stress tensor is assumed to be governed by a general Orlicz function, our theory includes various cases of (possibly degenerate) shear thickening and shear thinning fluids; including the mode case of power law fluids. This is a joint work with Sebastian Schwarzacher.