Supplementary Figures: Interplay between elastic instabilities and shear-banding: Three categories of Taylor-Couette flows and beyond

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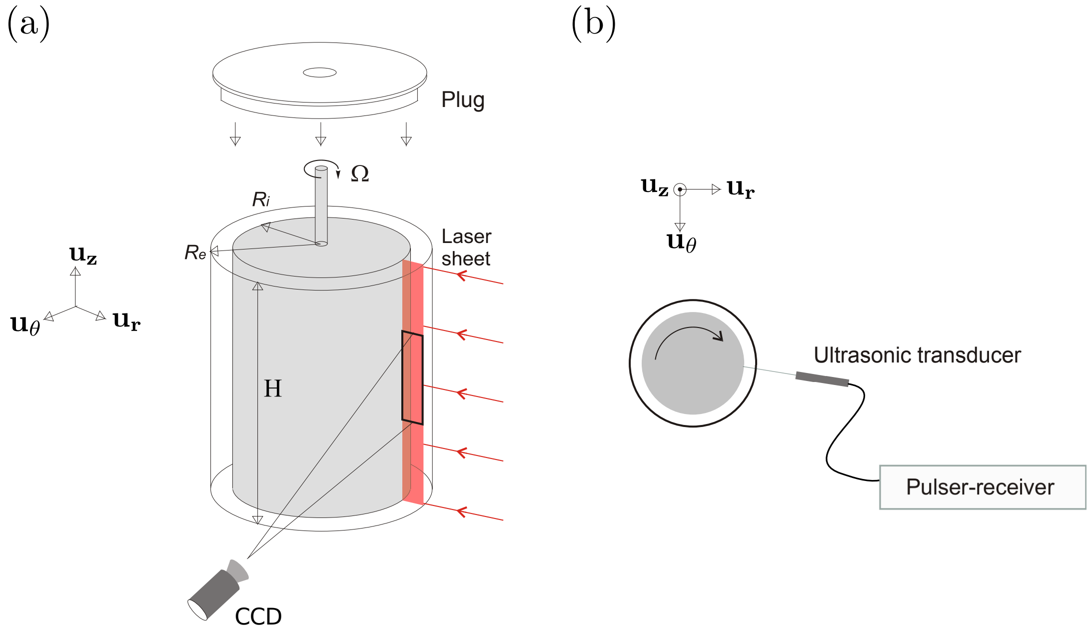

FIG. 1. (a) The experimental setup for the observation of the gap in the plane (r, z). (b) Top view of the Couette cell and of the measurement configuration for ultrasonic velocimetry. In both cases, the outer cylinder is surrounded by water which keeps the sample at a constant temperature.

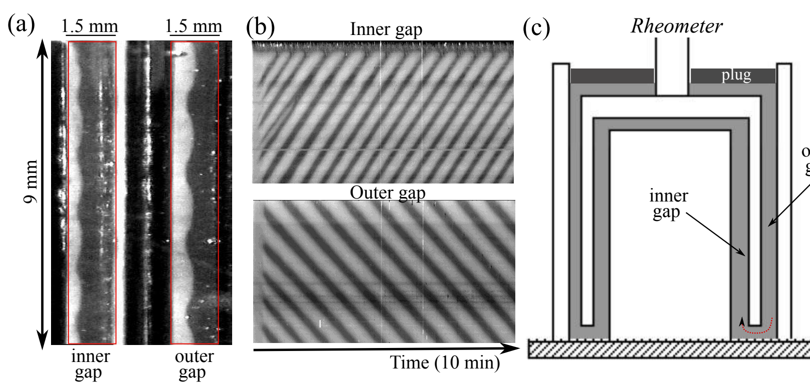

FIG. 2. (a) Visualization of the inner and outer gaps in a cylindrical double-gap geometry. The fluid is [CTAB]=0.3 M and [$NaNO_3$]=0.4 M at T=30°C. The shear rates in the inner and outer gaps are respectively $\dot{\gamma}_{in} \simeq 35$ s^{-1} and $\dot{\gamma}_{out} \simeq 45$ s^{-1}. Both gaps are 1.5 mm wide, the inner gap with $\Lambda_{in} = 0.16$ and the outer gap with $\Lambda_{out} = 0.12$. (b) Spatiotemporal diagrams of the interface kinematics in the inner and outer gap. The vortices are travelling along z in opposite direction, most likely due to an axial flow generated at the bottom of the double gap apparatus. (c) Sketch of the double-gap geometry.

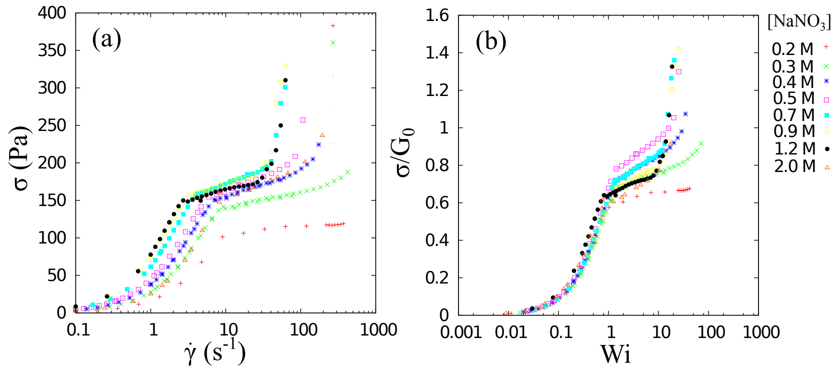

FIG. 3. (a) Flow curves for varying salt concentrations, with [CTAB]=0.3 M and $T = 30°$C, in the TC cell with $\Lambda = 0.08$. (b) Corresponding dimensionless curves.

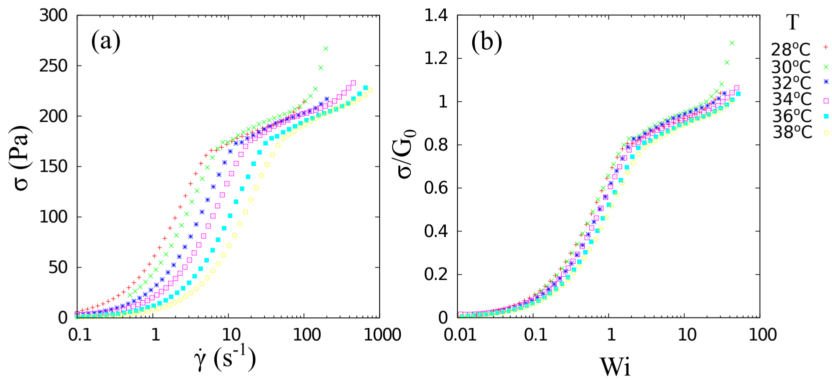

FIG. 4. (a) Flow curves for varying temperatures, with [CTAB]=0.3 M and [$NaNO_3$]=0.4 M, in the TC cell with $\Lambda = 0.04$. (b) Corresponding dimensionless curves.

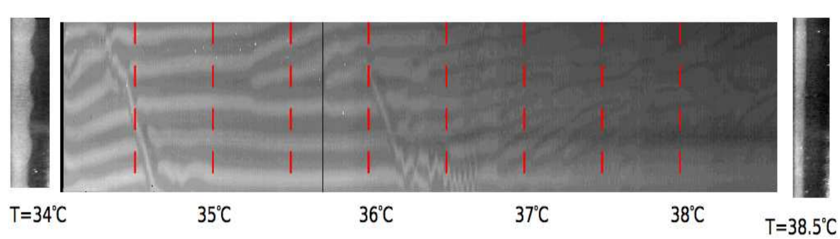

FIG. 5. Stabilization of the flow by a quasi-static increase of T. By increasing temperature quasi-statically (0.5°C every 10 min, dotted lines) we can study the transition between C_2 and C_3 (CTAB 0.3M, $NaNO_3$ 0.4M, $\Lambda = 0.08$, $\dot{\gamma} = 180$ s^{-1}). Travelling events at $T \simeq 34.5$ and 36°C are due to a bubble at the interface.