# Supplementary Information: Capillary tube wetting induced by particles: toward armoured bubbles tailoring

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## I. SUPPLEMENTARY MOVIES

### Movie S1

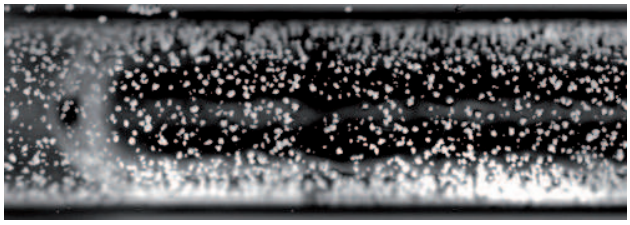

FIG. 1: **Regime 1**: Movie showing the evolution of a liquid finger pushed at constant flow rate inside a perfectly wettable capillary tube covered with perfectly wettable particles. Time is accelerated by a factor of 4. This movie illustrates **Fig. 5 A** of the manuscript.

### Movie S2

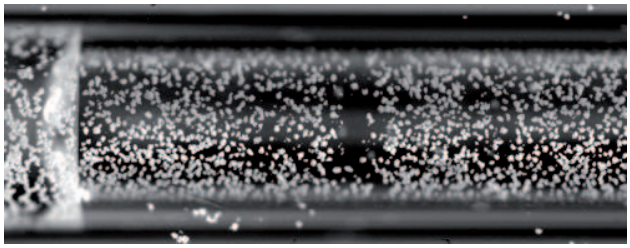

FIG. 2: **Regime 1**: Movie showing the evolution of a liquid finger pushed at constant flow rate inside a partially wettable capillary tube covered with perfectly wettable particles. Time is accelerated by a factor of 4. This movie illustrates **Fig. 5 B** of the manuscript.

**Movie S3**

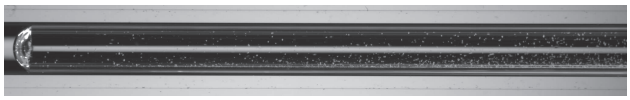

FIG. 3: **Regime 2**: Movie showing the collection of particles by the meniscus when a liquid is pushed inside a perfectly wettable capillary tube covered with partially wettable particles . Time is accelerated by a factor of 10. This movie illustrates **Fig. 6 B** of the manuscript.

**Movie S4**

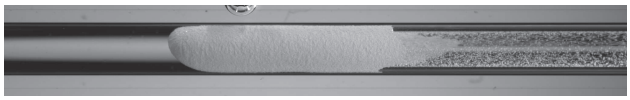

FIG. 4: **Regime 2**: Movie showing the formation and growth of the gas finger encapsulated inside a monolayer of particles. Time is accelerated by a factor of 10. This movie illustrates **Fig. 6 C** of the manuscript.

**Movie S5**

FIG. 5: **Regime 2**: Movie in real time showing the pinch-off of the encapsulated gas finger. This movie illustrates **Fig. 6 D** of the manuscript.

**Movie S6**

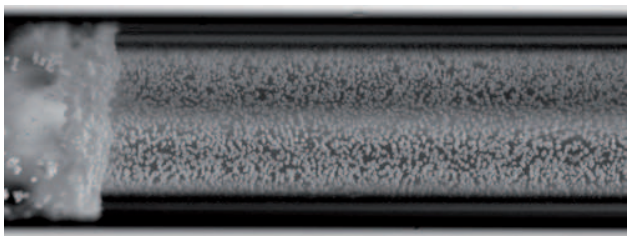

FIG. 6: **Regime 3**: Movie showing the evolution of a liquid finger pushed at constant flow rate inside capillary tubes with highly wettable walls covered with partially wettable particles whose contact angle $\theta_p$ is under the critical value $\theta_c$ defined by eq. (5). Time is accelerated by a factor of 4. This movie illustrates **Fig. 7** of the manuscript.

**Movie S7**

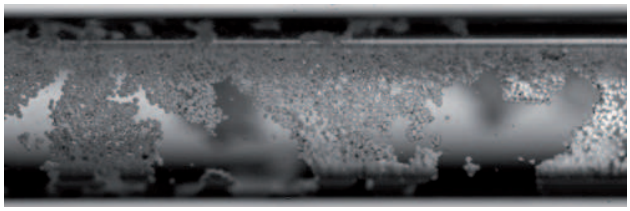

FIG. 7: **Regime 4**: Movie showing the evolution of a liquid finger pushed at constant flow rate inside a capillary tube with low wettability covered with partially wettable particles.. Time is accelerated by a factor of 6. This movie illustrates **Fig. 8** of the manuscript.

**Movie S8**

FIG. 8: **Increase of the plug resistance to motion due to particles collection**: Movie showing the slow down of a liquid plug pushed at constant flow rate $\delta P = 0.2$ kPa inside a capillary tube covered with particles (wetting conditions correspond to regime 2). This first movie shows the decrease of the plug velocity due to Coulomb friction of particles with the walls. Time is accelerated by a factor of 2. This movie illustrates **Fig. 9** of the manuscript.

**Movie S9**

FIG. 9: **Increase of the plug resistance to motion due to particles collection**: Movie showing stick slip motion of the gas finger once it has reached a critical size. Time is accelerated by a factor of 15. This movie illustrates **Fig. 9** of the manuscript.