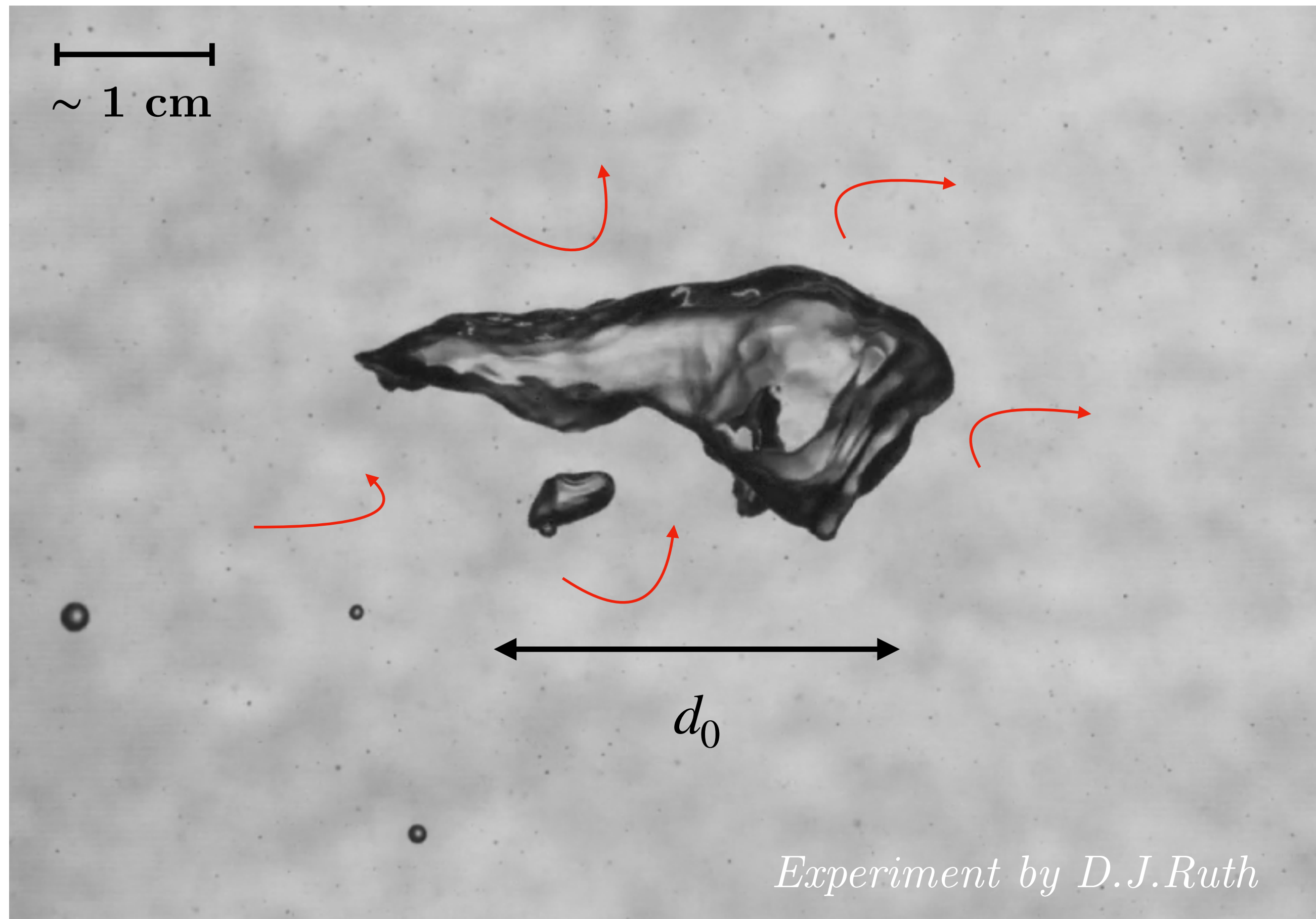


# Bubble break-up criterion

Kolmogorov (1949) Hinze (1955) Theory



- ▶  $d_0$  in the inertial range
- ▶ Inertial force  $\sim \rho U^2 d_0^2$
- ▶ Capillary force  $\sim (\gamma/d_0)d_0^2$

$$We = \frac{\rho U^2 d_0}{\gamma}$$

$$U = \langle \delta u(d_0)^2 \rangle^{1/2}$$

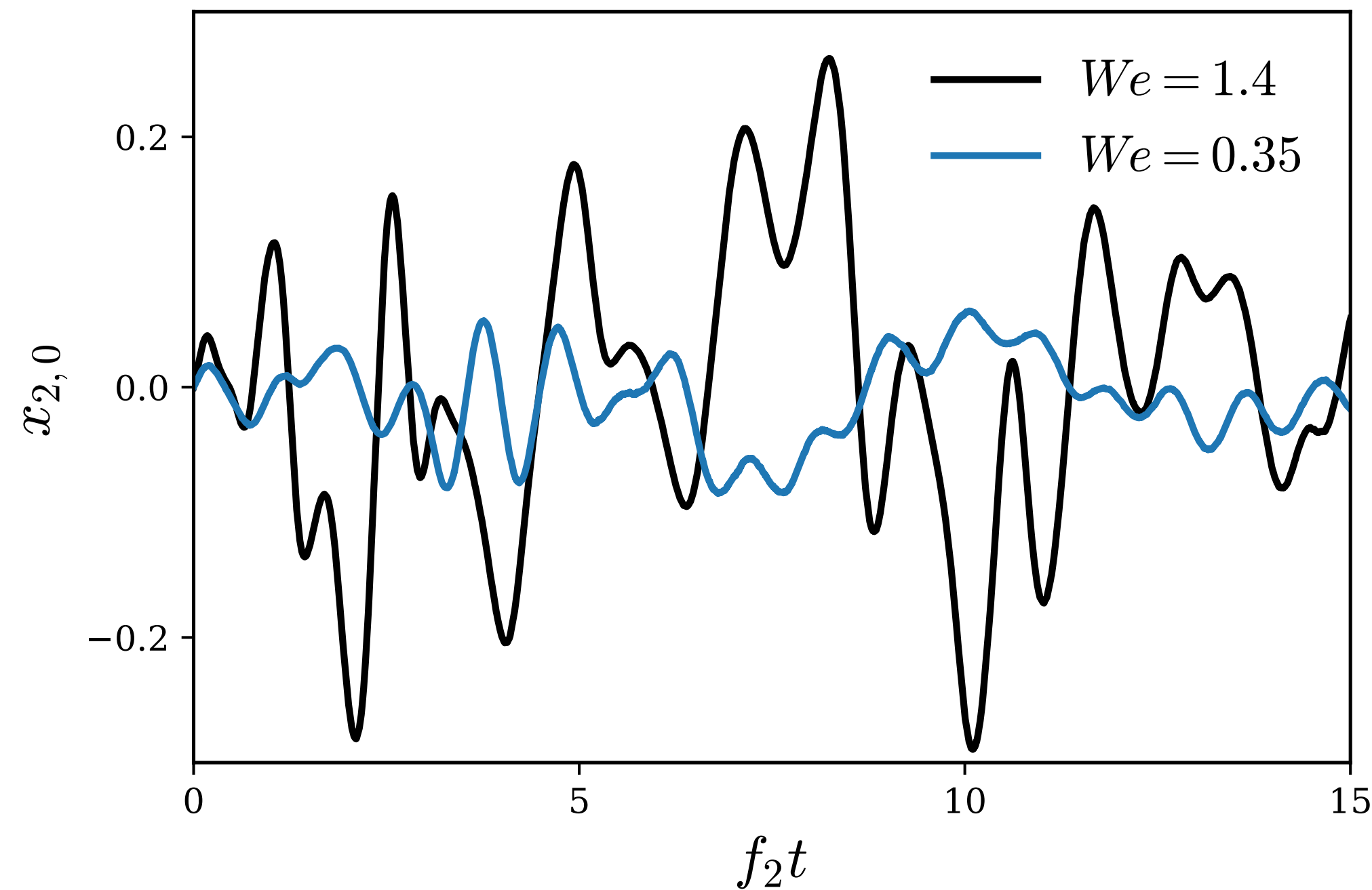
$$We_c = We(d_h)$$

$$d_h \approx 1 \text{ mm}$$

**Strict** limit between stable and unstable bubbles

# Toward a better definition of $We_c$

## Dynamics of oblate-prolate modes



$$\ddot{x}_\ell + \Lambda_\ell \dot{x}_\ell + \Omega_\ell^2 x_\ell = \mathcal{T}_\ell(t)$$

*Risso & Fabre (1998), Lalanne & al (2019),  
Masuk & al (2021), (Roa & al (2023) - drops)*

## Quantification of the breakup probability

