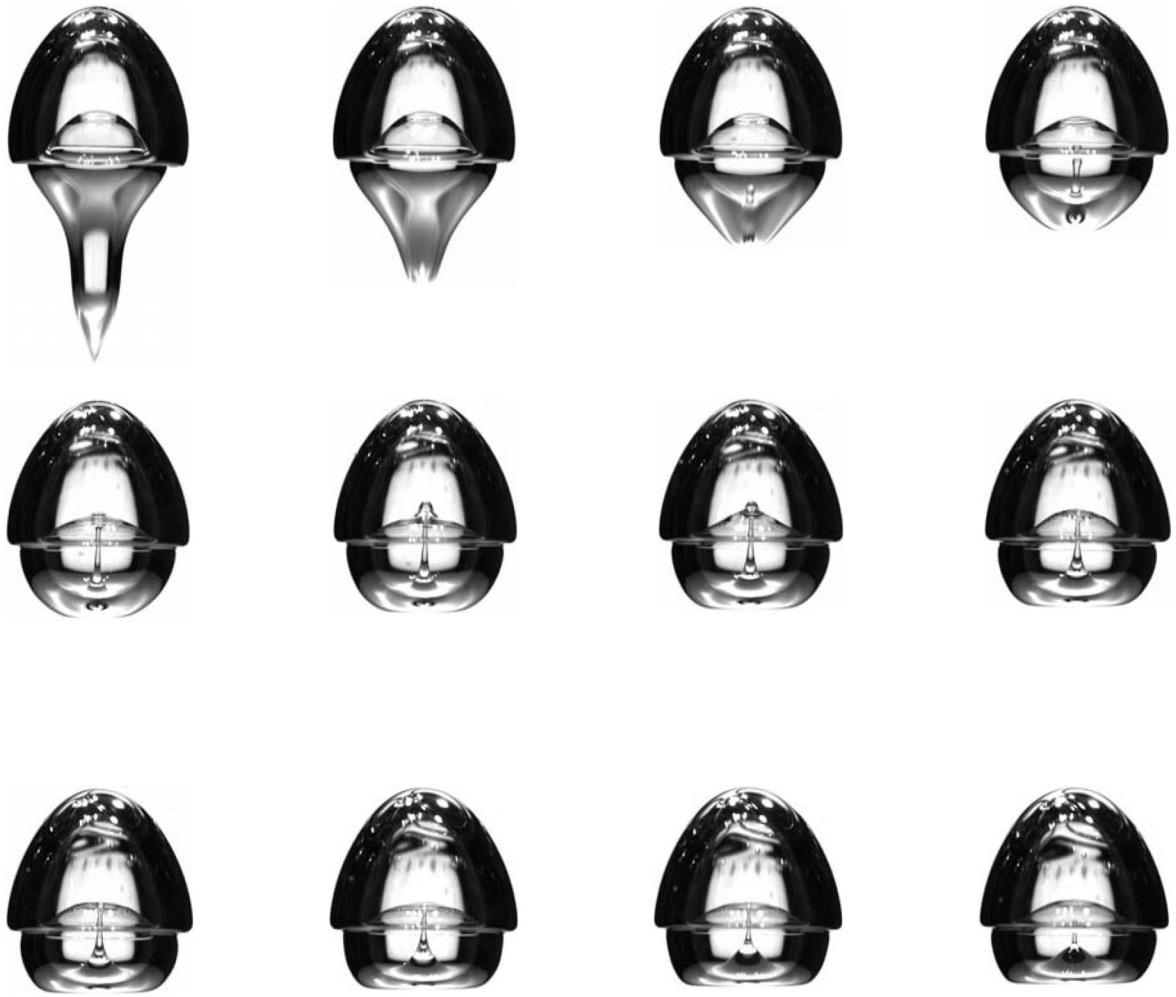

FIG. 1. Time sequence showing a jet developing during the interaction between two bubbles (Ref. 1). The time lapse between the snapshots is $\Delta t = 1/500$ s, the airflow rate 1 l.min^{-1}, the injector diameter d = 1.8 mm, the fluid height h = 4 cm and the fluid viscosity $\eta = 110$ mPa.s.

Jets in viscous bubbles

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We study experimentally the formation and dynamics of large bubbles in a bubbling configuration.[1] A constant airflow rate is injected in a viscous liquid from a submerged nozzle. At low airflow rates, bubbles rise independently and recover a quasi-spherical shape. Conversely, at sufficiently high flow rates, pairs of bubbles start to interact as shown in Fig. 1. There, the wake of the leading bubble sucks the trailing one and strongly deforms it. The non-equilibrium dynamics of this elongated bubble exhibits an intense and concentrated jet developing right after detachment. For even larger flow rates, this jet is so violent that perforation of the bubble and of the free surface may occur, resulting in liquid eruptions as shown in Fig. 2.

[1]See supplementary material at http://dx.doi.org/10.1063/1.3640015 for a video illustrating this paper.

FIG. 2. Snapshot of a 15 cm high jet springing up above the free surface (Ref. 1) for an airflow rate of 3.5 l.min^{-1}.

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