

# Foam droplet falling in a Hele-Shaw cell

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## ABSTRACT

The static and dynamic features of foam strongly depend on its liquid fraction [1-3]. For example, wet foam flows like fluid, however, dry foam behaves like an elastic material. The rheology of foam sometimes can be an important issue also in our daily lives. When does a soap foam fall down if we spray it on a vertical wall? How do the physical properties such as liquid fraction and foam size affect its behaviors? To address these questions, we carried out a model experiment. We confined a foam droplet in a Hele-Shaw cell. The foam droplet falls down by gravitational force when we stand up the cell. We found two characteristic falling down modes: (a) “foam droplet mode” where the whole foam droplet falls down, and (b) “liquid-thread mode” where a liquid droplet pinched off from the foam falls down with making a liquid thread. The border between two modes seems to depend not only on liquid fraction but also on the size of the foam droplet. We will present our experimental results and theoretical discussion.

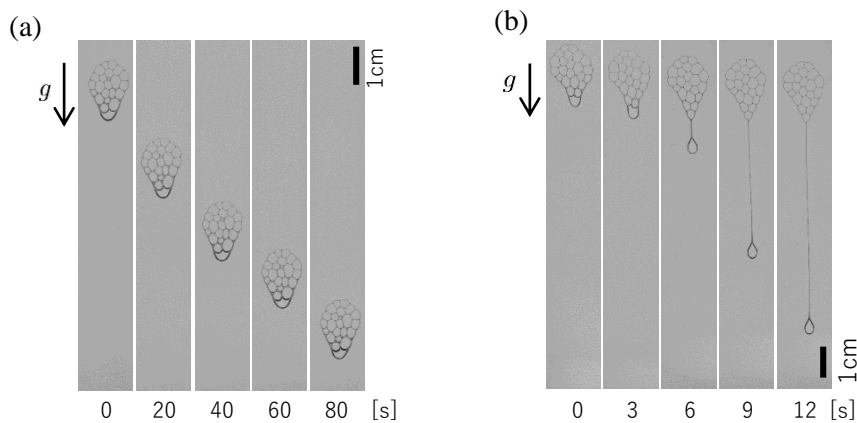


Figure 1: Foam droplet falling down in a Here-Shaw cell:

(a) “foam droplet mode” and (b) “liquid-thread mode”.

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[3] N. Yanagisawa and R. Kurita. *Sci. Rep.* **9**, 5152 (2019).