

Invitation to  
Fluid Mechanics & Engineering  
**Colloquium**  
#03/SY2018

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日時と場所 平成 30 年 7 月 30 日 (月) 17 : 00 ~ 18 : 00

セミナー室 3-B (A5-66) 工学部 A 棟 5 階

講師 Dr. Harunori YOSHIKAWA

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講演題目 Formation of spiral patterns in a liquid-fed Rayleigh-Taylor system.

講演内容 :

The spontaneous formation of spiral patterns is often observed in the excitable media [1], where the nonlinear coupling of excitation and recovery variables plays a key role in wave generation. Observed patterns rotate, in general, with spiral arms trailing the direction of rotation. I will report a formation of spiral patterns in a non-excitable system. The system consists of a downward-facing free surface of a horizontal liquid film maintained by continuous liquid feeding [2]. The surface is unstable to the Rayleigh-Taylor (RT) instability and the resulting liquid discharge from the film can occur in the form of spiral liquid curtains. These curtains rotate with their arms leading the direction of rotation. With the help of a phenomenologically developed cellular automaton, we show that the patterns result from the synchronized emergence of the RT instability with the motion of curtains.

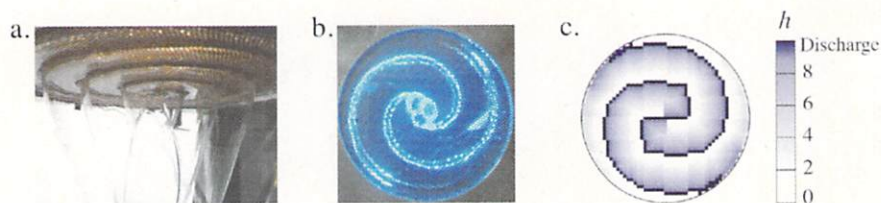


FIGURE. Spiral patterns observed in the liquid discharge from a downward-facing free surface. Experimental images in side view (a) and in top view (b). A pattern produced by a phenomenologically developed CA (c).

参考文献

[1] M. Cross and H. Greenside, *Pattern formation and dynamics in nonequilibrium systems*, Cambridge University Press, New York, 2009. [2] C. Pirat, C. Mathis, P. Maïssa, L. Gil, Phys. Rev. Lett. **92**, 104501, 2004.