

Abstract Submitted  
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**Regular non-coarsening surface patterns on evaporating heated films** MICHAEL BESTEHORN, Dep. Theor. Physics, BTU Cottbus, Germany, MERKT DOMNIC — We study a thin liquid film with a free surface on a uniformly heated substrate. The film is heated from the gas side. We show that if the fluid is initially in equilibrium with its own vapor in the gas phase, regular long-scale surface patterns in the form of long-wave hexagons or stripes having a well defined lateral length scale can be observed [1]. This is in sharp contrast to the case without evaporation where coarsening or rupture to larger and larger patterns is seen in the long time limit. In this way, evaporation could be used for regular structuring of the film surface. Finally we show how other stability mechanisms can be included, e.g. the Marangoni effect or Van der Waals forces in ultra thin films. In this way, a much richer pattern dynamics is expected, showing also squares, stripes and hexagons. and transitions among them.

[1] M. Bestehorn, D. Merkt, Phys. Rev. Lett. **97**, 127802 (2006)

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