Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Convection Cells driven by Spontaneous Symmetry Breaking[1]
MICHEL PLEIMLING, BEATE SCHMITTMANN, R.K.P. ZIA, Virginia Polytechnic Institute and State University — A clear signature of far-from-equilibrium systems, convection cells are ubiquitous in nature. Typically, they are driven by external forces, like gravity (in combination with temperature gradients) or shear. Here, we show the existence of such cells in a simple (possibly the simplest) system involving only a temperature gradient. In particular, we study a two-dimensional Ising lattice gas in contact with two thermal reservoirs, one at infinite temperature and another at a finite T. When T drops below the critical temperature, phase separation emerges and creates convection cells.

[1]Supported in part by NSF-DMR-0705152 and NSF-DMR-0904999.

Michel Pleimling
Virginia Polytechnic Institute and State University

Date submitted: 16 Nov 2009 Electronic form version 1.4