

Abstract Submitted
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On the coarsening of two-dimensional foams BENJAMIN BOSSA, IRPHÉ, Marseille, JÉRÔME DUPLAT, IUSTI, Marseille, EMMANUEL VILLERMAUX, IRPHÉ, Marseille — Besides its common and esthetic character, foam coarsening is a paradigm for aging in a broad class of complex systems. Among the natural questions to characterize the process are that of the shape of the cell size distribution, its rate of deformation, the effect of initial conditions, the possible existence of an attractive self-similar regime, and the link with the microscopic rate of change of a cell area prescribed by von Neuman's law. We address these questions using a foam “wind tunnel” consisting in a long Hele-Shaw cell where we inject continuously CO_2 bubbles at one extremity and follow the resulting 2D foam as it progresses towards the other end of the cell. Averaging on time at fixed locations along the cell, we thereby have access to several aspects of the foam structure at different successive instants of its life. We will focus on the cell size distribution and number of neighbors conditioned to cell size and will show in particular that these quantities are progressively insensitive to the way the foam has been initially prepared. These observations legitimate a mean-field representation of the aging process which successfully represents the overall foam evolution.

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