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**Homogenization of a Hele-Shaw problem in periodic and random media.** (English)

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Summary: We investigate the homogenization limit of a free boundary problem with space-dependent free boundary velocities. The problem under consideration can be transformed to a well-known obstacle problem, formally obtained by integrating with respect to the time variable. By making rigorous the link between these two problems, we are able to derive an explicit formula for the homogenized free boundary velocity, and we establish the uniform convergence of free boundaries.

**MSC:**

76D27 Other free boundary flows; Hele-Shaw flows

76M50 Homogenization applied to problems in fluid mechanics

35B27 Homogenization in context of PDEs; PDEs in media with periodic structure

35R35 Free boundary problems for PDEs

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**Keywords:**

free boundary problem; obstacle problem; uniform convergence

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