

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Multiple steady bubbles in a Hele-Shaw channel CHRISTOPHER GREEN, University of California San Diego, GIOVANI VASCONCELOS, Federal University of Pernambuco — We construct analytical solutions, in the form of conformal mappings, solving the free boundary problem for the shapes of any finite number of steadily translating bubbles in a Hele-Shaw channel. These solutions can be decomposed into the sum of two analytic functions - corresponding to the complex potentials in the laboratory and co-travelling frames - which conformally map a bounded multiply connected circular domain onto respective degenerate polygonal domains (infinite strips with interior slits of finite-length which are either horizontally or vertically aligned). These functions are obtained using the generalised Schwarz-Christoffel formula for multiply connected domains in terms of the Schottky-Klein prime function. The solutions we have found are very general and make no assumptions on the geometrical arrangement of the bubbles.

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Date submitted: 21 Jul 2014

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