

Abstract Submitted  
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**Nonlinear Dynamics of Droplets in a Hele-Shaw Cell: Short-Lived Solitary Waves in a 1D Lattice** AMIR GAT, DANILA MEIMUKHIN, YULI STAROSVETSKY, Technion - Israel Institute of Technology — We study the nonlinear dynamics of a one-dimensional lattice consisting of shallow droplets, immersed in an immiscible liquid flowing within a Hele-Shaw cell. Such configurations are commonly used in micro-fluidic devices for chemical and biological applications. We apply regular multi-scale expansions constructed for the asymptotic limit of low energy excitations. The expansions yield Korteweg de Vries and linear Schrodinger equations governing the system dynamics, which is remarkable for configurations without inertial effects. Solutions of the governing equation are shown to include a special class of short-living solitary waves. The analytical findings are validated by the numerical computations.

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