Exact solution of the Muskat–Leibenzon problem for a growing elliptic bubble

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Abstract

© 2016, Pleiades Publishing, Ltd.The exact solution of the two-phase time-dependent Hele–Shaw problem (in other words, the plane Muskat–Leibenzon problem) in which a fluid occupied an unbounded channel is displaced by another fluid incoming through a slitted cut in the channel. In this case the interface between the phases, namely, fluids of different viscosity, evolves as an ellipse whose area and eccentricity vary continuously.

Keywords

growing elliptic bubble, Muskat–Leibenzon problem, two-phase time-dependent Hele–Shaw problem