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Inverse Saffman-Taylor instability in Hele-Shaw experiments using micro-particles[1] FARZAM ZOUESHTIAGH, University of Lille, IEMN-CNRS 8520, ILYESSE BIHI, University of Lille, IEMN-CNRS 8520, University of Florida, JASON BUTLER, University of Florida, CHRISTINE FAILLE, University of Lille, INRA-PIHM, MICHAL BAUDOIN, University of Lille, IEMN-CNRS 8520
— Saffman-Taylor instability can occur when a low viscosity fluid displaces one of higher viscosity. It results from the decrease of the flow resistance as the fluid of lower viscosity replaces the more viscous one. This Saffman-Taylor instability is revisited experimentally for the inverse case of a viscous fluid displacing air when partially wetting particles are lying on the walls. Though the inverse case is otherwise stable, the presence of the particles results in a fingering instability at low capillary number. This capillary-driven instability is driven by the integration of particles into the interface which results from the minimization of the interfacial energy [1].
Bihi et al., Phys. Rev. Lett., 117: 034501, 2016

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Farzam Zoueshtiagh
University of Lille, IEMN-CNRS 8520

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