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Hector A Chang-Lara* (changlara@math.columbia.edu), New York, NY 10027, and **Nestor Guillen**. *Regularity for the Free Boundary of Hele-Shaw by Approximation*.

We propose a method to determine the smoothness for the free boundary of sufficiently flat solutions of one phase Hele-Shaw problems. We notice that under a flatness assumption the free boundary—represented by the hodograph transform of the solution—solves a nonlinear integro-differential equation. This nonlinear equation can be linearized to a (nonlocal) parabolic equation with bounded measurable coefficients, for which regularity estimates are available. (Received August 16, 2016)