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**Andrew Belmonte.** *Inertial effects on viscous fingering in the complex plane.*

We present the generalized Darcy's equation, which includes inertial effects for flows in Hele-Shaw cells, and discuss when it reduces to the classical Darcy's law. A generalized Polubarinova-Galin equation in the complex plane is derived for a circular geometry. The linear stability of the base-flow state is examined by perturbing the corresponding conformal map - we show that inertia always has a tendency to stabilize the interface. (Received September 16, 2010)