Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Universality Results for Multi-layer Radial Hele-Shaw Flows[1]
PRABIR DARIPA, CRAIG GIN, Deaprtment of Mathematics, Texas A&M University, College Station, TX-77845, DARIPA RESEARCH TEAM — Saffman-Taylor instability is a well known viscosity driven instability of an interface separating two immiscible fluids. We study linear stability of this displacement process in multi-layer radial Hele-Shaw geometry involving an arbitrary number of immiscible fluid phases. Universal stability results have been obtained and applied to design displacement processes that are considerably less unstable than the pure Saffman-Taylor case. In particular, we derive universal formula which gives specific values of the viscosities of the fluid layers corresponding to smallest unstable band. Other similar universal results will also be presented. The talk is based on ongoing work.

[1]Supported by an NPRP Grant # 08-777-1-141 from the Qatar National Research Fund (a member of the Qatar Foundation). The statements made herein are solely the responsibility of the authors.

Prabir Daripa
Deaprtment of Mathematics, Texas A&M University,
College Station, TX-77845

Date submitted: 16 Nov 2013 Electronic form version 1.4