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**David M Ambrose\*** ([dambros@clemsn.edu](mailto:dambros@clemsn.edu)), Department of Mathematical Sciences, Martin Hall, Clemson University, Clemson, SC 29634. *Free Surface Darcy Flows*.

I will present recent results on well-posedness of free surface problems in fluid flows, where the fluid velocities satisfy Darcy's Law. In both two and three dimensions, we find that the initial value problem is well-posed as long as a stability condition is satisfied; this is the nonlinear version of a condition of Saffman and Taylor. If time allows I will present further results, from joint work with Steve Shkoller, on well-posedness and stability conditions for some rotational Darcy flows. (Received February 11, 2008)