1146-65-287 **Alistair Bentley*** (abentle@g.clemson.edu), Dept. Math. Sci., Clemson University, Clemson, SC 29634-0975, **Chris Kees** (chris.kees@usace.army.mil), U.S. Army Corps of Engineers, Vicksburg, MS 39180, and **Vince Ervin** (vjervin@clemson.edu), Dept. Math. Sci., Clemson University, Clemson, SC 29634-0975. *Efficient Linear Solvers for Two-Phase Navier-Stokes Equations in Free-Surface Models.*

Free-surface models are a powerful tool for simulating the dynamic hydraulic processes that appear in many industrial applications. Solving the sparse linear system of equations that arise from the two-phase Navier-Stokes equations makes up a significant portion of the computational effort needed to numerically approximate these free-surface models. In this talk, we present a block preconditioner for the two-phase Navier-Stokes equations that uses a new two-phase pressure convection diffusion operator to approximate the Schur complement. To illustrate this preconditioner's effectiveness, we compare parallel results from an industrial application with other preconditioning strategies. (Received January 25, 2019)