

1145-65-1227      **L. Ridgway Scott\*** ([ridg@uchicago.edu](mailto:ridg@uchicago.edu)), Department of Mathematics, University of Chicago,  
Chicago, IL 60637. *Recent advances for exactly incompressible elements*. Preliminary report.

Finite element approximations satisfying exact incompressibility conditions are now recognized as essential for certain flow simulations. We discuss two enhancements for algorithms based on what is known as the Scott-Vogelius method. One is known as the unified Stokes algorithm (USA) and projects the discontinuous pressure arising in Scott-Vogelius onto a continuous pressure space. The other enhancement relates to multi-grid solvers. It involves new smoothers that preserve the incompressibility condition and insure optimal convergence. (Received September 20, 2018)