1153-65-257 **Joseph Fiordilino*** (joseph.a.fiordilino1@navy.mil), PO Box 5000, Corona, CA 92878-5000.
Efficient and modular grad-div stabilization.

In this talk, we present modular grad-div algorithms for calculating solutions to the Navier-Stokes equations (NSE). These algorithms add a minimally intrusive module, to an NSE code, that implements grad-div stabilization. Further, they do not suffer from either solver breakdown or debilitating slow down for large values of grad-div parameters. We will discuss the unconditional, nonlinear, energy stability and optimal-order (first- and second-order) convergence of the algorithms. Results of numerical tests will be presented to illustrate the benefits of these algorithms over a fully coupled grad-div stabilization.

Distribution Statement A. Approved for public release; distribution is unlimited. (NSWC Corona Public Release Control Number: 19-008). (Received August 29, 2019)