1126-65-101   **Zhu Wang*** (`wangzhu@math.sc.edu`), Department of Mathematics, 1523 Greene Street, Columbia, SC 29208. *An efficient algorithm for simulating ensembles of parameterized flow problems.*

Many applications of computational fluid dynamics require multiple simulations of a flow under different input conditions. In this talk, a numerical algorithm is developed to efficiently determine a set of such simulations in which the individually independent members of the set are subject to different viscosity coefficients, initial conditions, and/or body forces. The proposed scheme applied to the flow ensemble leads to need to solve a single linear system with multiple right-hand sides, and thus is computationally more efficient than solving for all the simulations separately. We show that the scheme is nonlinearly and long-term stable under certain conditions on the time-step size and a parameter deviation ratio. Rigorous numerical error estimate shows the scheme is of first-order accuracy in time and optimally accurate in space. Several numerical experiments are presented to illustrate the theoretical results. (Received January 07, 2017)