1154-65-478 **Zhu Wang*** (wangzhu@math.sc.edu). *Efficient algorithm for simulating ensembles of parameterized flow problems.*

Many computational fluid dynamics applications require multiple simulations of a flow under different input conditions. In this talk, we consider such settings for which one needs to perform a sequence of simulations based on the Navier-Stokes equations, each having different initial condition data, boundary condition data, forcing functions, and/or coefficients such as the viscosity. For such settings, we propose ensemble methods to accelerate the solutions. The main idea is to manipulate the time-stepping scheme so that all the problems could share a common coefficient matrix, then, instead of solving a sequence of linear systems with one right-hand-side vector, the method needs to solve one linear system with multiple right-hand-sides. The computational efficiency is then improved by using block iterative algorithms. Rigorous analyses are given proving the conditional stability and establishing error estimates for the proposed algorithms. Numerical experiments are presented to illustrate the analyses. (Received September 08, 2019)