

1161-65-98

Xiaobing Feng* (xfeng@math.utk.edu), Department of Mathematics, 1403 Circle Drive,
Knoxville, TN 37996. *Recent developments in numerical methods for stochastic Stokes equations.*

Besides the mathematical interests, stochastic Stokes (and Navier-Stokes) equations have been proposed to study turbulence flow under random forcing. Even in the simplest setting, their PDE solutions have very low regularity in time, which then poses a significant challenge for developing efficient and convergent numerical methods for the stochastic Stokes and (Navier-Stokes) equations. In particular, the most natural and popular class of numerical methods for those equations, namely mixed finite element methods, had not been proven to work. In this talk we shall present some recent developments in mixed finite element and splitting methods for the Stokes equations with multiplicative noise. We shall highlight the continuous and discrete stochastic inf-sup conditions and the strong convergence for both the velocity and pressure approximations, as well as the new analysis techniques used to obtain these results. Numerical experiments will also be presented to validate the theoretical results. (Received August 12, 2020)