1092-60-202 **Igor Cialenco** (igor@math.iit.edu), Engineering 1, Room 125B, 10 W. 32nd Street, Chicago, IL 60616, and **Liaosha Xu*** (lxu29@hawk.iit.edu), 2800 S Lowe Ave. Side 2R, Chicago, IL 60616.

On Convergence in Probability and Hypothesis Testings for Stochastic PDEs.

In this paper, we exploit some technics on weak convergence to study hypothesis testing problem for the drift/viscosity coefficient for stochastic fractional heat equation driven by additive space-time white noise. We assume that the first N Fourier modes of the solution are observed continuously over time interval $[0, T]$. We introduce the notion of asymptotically the most powerful test, and find explicit forms of such test in two asymptotic regimes: large time asymptotics $T \to \infty$, and increasing number of Fourier modes $N \to \infty$. The proposed statistics are derived based on Maximum Likelihood Ratio. Over the course of proving the main results, we obtain a series of technical results on the asymptotic behaviors of the probabilities related to likelihood ratio, which are also, in some sense, of high value for study in probability theory. In particular, we find the cumulant generating function of the log-likelihood ratio, we obtain some sharp large deviation type results for both $T \to \infty$ and $N \to \infty$, and develop some useful strategies in probability convergence for studying asymptotic properties of the power of the likelihood ratio type tests. (Received August 09, 2013)