1081-35-98 **Wenxian Shen*** (wenxish@auburn.edu), Department of Mathematics and Statistics, Auburn University, Auburn, AL 36849, and **Xiaoxia Xie**. *Approximations of Random Dispersal Operators/Equations by Nonlocal Dispersal Operators/Equations.* Preliminary report.

Both random dispersal and nonlocal dispersal evolution equations are widely used to model diffusion systems in applied sciences. This talk is concerned with the approximations of random dispersal operators/equations by nonlocal dispersal operators/equations. It first proves that the solutions of properly rescaled nonlocal dispersal initial-boundary value problems converge to the solutions of the corresponding random dispersal initial-boundary problem. Next, it proves that the principal spectrum points of time and/space periodic nonlocal dispersal operators with properly rescaled dispersal kernels and Dirichlet type or Neumann type or periodic boundary condition converge to the principal eigenvalue of the corresponding time and/or space periodic random dispersal operator with Dirichlet or Neumann or periodic boundary condition. Finally, it proves that the unique positive periodic solutions of nonlocal dispersal KPP equations with properly rescaled dispersal kernels converge to the unique positive periodic solution of the corresponding random dispersal KPP equation. The above results show that the dynamics of random dispersal equations can be well approximated by properly rescaled nonlocal dispersal equations. (Received February 02, 2012)