1086-35-586   **Lihua Zuo***, lzuo@math.tamu.edu, and **Xu** and **Rundell**. *inverse boundary and source problem for fractional diffusion equations.*

Inverse boundary and source problems for time-fractional diffusion equations are considered in this presentation, in which either the nonlinear flux function on the boundary or the nonlinear source function is unknown and to be determined. In contrast to the standard diffusion kernel, we have new fractional kernel so there will be challenges analytically and numerically. Based upon the free space fundamental solution, we derive a representation for the solution for the forward problem. Then a mapping will be constructed by the forward solution and to be shown as a contraction map so we get the uniqueness and reconstructibility under some assumptions and applying the fixed point theorem. Numerical examples will be presented to illustrate the validity and effectiveness of the proposed method. (Received September 07, 2012)