Meeting: 999, Nashville, Tennessee, SS 9A, Special Session on Inverse Problems

999-35-120 **Yongzhi Steve Xu*** (ysxu0001@louisville.edu), Department of Mathematics, University of Louisville, Louisville, KY 40292. *An inverse problem for the free boundary model of ductal carcinoma in situ.* Preliminary report.

In an earlier paper, we developed a free boundary model to describe the homogeneous growth inside a cylinder, a model mimicking the growth of a ductal carcinoma in situ (DCIS). Assuming that we know the coefficients of the model, we analyzed the growth tendency of DCIS. The analysis and computation of the problem show interesting results that are similar to the patterns found in DCIS.

In this talk we present a new kind of inverse problems related to the free boundary model of DCIS. Assuming that we know the solution of the free boundary problem in a section of the cylinder, along with the known initial, boundary and free boundary conditions, we consider the inverse problem of finding the coefficients and the solution in the cylinder.

The motivation of this problem is to develop mathematical methods to diagnose growth tendency of DCIS from biopsy data. (Received August 17, 2004)