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Yongzhi Steve Xu* (ysxu0001@louisville.edu), Department of Mathematics, University of Louisville, Louisville, KY 40292. *Study of some inverse problems raised from a free boundary model of ductal carcinoma in situ.*

In this talk we discuss some inverse problems raised from a free boundary model of ductal carcinoma in situ (DCIS). In [1], we introduced a number of inverse problems of free boundary model of DCIS. We will present some recent results related to the inverse problems.

We use some transformation and heat potential theory to establish the integral form of solution and proved the existence and uniqueness of solution to the related problem. Then we consider the inverse problem of determining the potential function of model from moving boundary information, which related to the mammography screening of DCIS. Algorithm and numerical simulation are presented to demonstrate the validity and applicability of solutions. (Received August 11, 2016)