## Adaptive Finite Element Methods for Inverse Problems

## Jun Zou\*

## Department of Mathematics, The Chinese University of Hong Kong, HK \*Email of Presenting Author: zou@math.cuhk.edu.hk

We will discuss several recently developed adaptive finite element methods for solving linear and nonlinear ill-posed inverse problems of PDEs. The adaptive reconstruction strategies are based on the least-squares formulations with appropriate Tikhonov regularizations and the discretization of the forward PDEs using continuous piecewise linear finite elements. Some effective a posteriori error estimates are derived in terms of the concerned state and adjoint variables and the unknown physical parameters involved in the concerned inverse problems of PDEs. Convergences of the adaptive FEMs are established, and the numerical results are demonstrated to confirm the convergence and efficiency of the adaptive FEMs. The results of this talk were based on several joint works with Bangti Jin (UCL), Jingzhi Li (SUSTC) and Yifeng Xu (Shanghai Normal University), and were substantially supported by Hong Kong RGC General Research Fund (projects 14306814 and 405513).