Department of Mathematics University of Houston

## Seminar on Computational Mathematics in Oil & Gas Exploration and Imaging

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## Seismic Ray Tomography

Tuesday, April 05, 2016 1:30 PM – 2:30 PM Room 646 PGH

Abstract: Velocity model building is one of the most important techniques in the industry of seismic data processing. Since the earlier work of detecting velocity anomalies of permafrost in 1985, travel time tomography for velocity model building has been accepted and widely applied in the industry. There are usually two main steps in a conventional tomography: Ray tracing and solver. Ray Tracing is the process to linearize the subsurface model response system into a huge linear system, and the solver is to update the velocity model by solving this linear system. The complexity of the formation structures and the huge scale of linear system remain the challenges of travel time tomography to the industry. Typically, velocity model building is an iterative process, which calls tomography process up to several tens of times. To enhance the efficiency of tomography code, parallel computing is indispensableas well as multithreading method. This talk will give a brief introduction of the seismic industry, such as velocity models, preprocessing, migrations, and will further focus on travel time tomography, including some ray theory and solver implementation.