

# The First Multi-Dimensional Data-Comprehensive Inverse-Scattering-Series (ISS) Internal-Multiple Elimination Method

## Research Themes

In seismic exploration, multiply reflected events (multiples) need to be removed before single reflected events (primaries) can be used to locate and delineate the hydrocarbon targets. Currently, there is no capability available in the petroleum industry for removing internal multiples that interfere with primaries in a multi-dimensional earth. ISS internal multiple removal method is the only multi-dimensional method with the potential to address the challenge without requiring any subsurface information. The multi-dimensional data-comprehensive ISS internal-multiple elimination method provides an effective response to this type of serious and frequently occurring challenge.

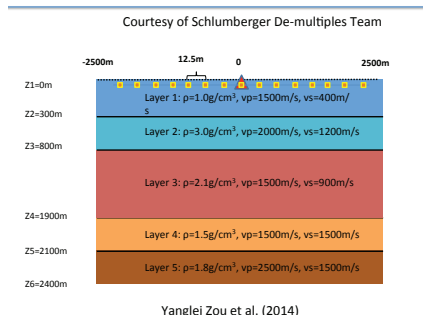
## Recent Accomplishments

- Identifying higher-order terms beyond internal-multiple attenuation in the Inverse-Scattering-Series for internal-multiple removal
- Development of multi-dimensional Inverse-Scattering-Series internal-multiple elimination algorithm
- Implementing and testing the Inverse-Scattering-Series internal-multiple elimination in a 2D subsurface
- These advances open up opportunities currently precluded and will allow targets that currently are inaccessible to become accessible and improving the drilling success rate when complicated interfering primaries and multiples are overlapped with the targets. These advances allow that kind of play to become successful.

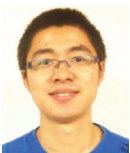
## Issues

- Combining the ISS internal-multiple spurious-event removal algorithm and ISS internal-multiple elimination algorithm to provide more seismic exploration and production capabilities
- Understanding and developing ISS internal-multiple elimination algorithms in an absorptive medium
- Reducing the run time of 2D/3D ISS internal-multiple attenuation and elimination algorithms for large seismic data

### ISS internal multiple elimination in an elastic earth



Yanglei Zou et al. (2014)



## Yanglei Zou

Major/Field of Study: Seismic Physics

College: College of Natural Sciences & Mathematics

Professor: Dr. Arthur Weglein

Email: yzou6@uh.edu

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