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The Contribution of Integrated Structural/Tectonic Studies of HRAM Data for Exploration and Exploitation of Resource Plays in North America

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The recent shift from conventional exploration to resource play exploitation has presented the geoscience community with a new and exciting set of challenges. Geologists, geophysicists, and petroleum engineers engaged in resource play exploitation are being challenged to identify "sweet spots" and "preferred trends" that are often controlled by extremely subtle geological features. Detection and analysis of these features often requires the use of tools and interpretation techniques which are not routinely used for conventional exploration.

IITECH has recently completed integrated structural and tectonic studies of several active resources play areas including: the Barnett shale in the Dallas Fort Worth Basin of West Texas; the Bakken Formation of the Williston Basin (USA and Canada); the Woodford and Fayetteville shales in the Arkoma and Ardmore Basins (Oklahoma); the Doig and Montney formations; and the Devonian shale play of the Horn River Basin, north east British Columbia (Canada). Results show that many of the resource plays contain "sweet spots" and "preferred trends" that are largely controlled by basement structures and topography. These features can be detected and analyzed through integrated analysis of magnetic data.

The objective of this talk is to illustrate our approach to regional structural interpretation and assessment of basins that contain developed and undeveloped resource plays. Special emphasis is placed on illustrating various imaging and filtering techniques that can be used to interpret the magnetic images in conjunction with existing 3D and 2D seismic and other pertinent geological information.