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OPTIMIZING RESOURCES

Impact Structures in Seismic Data: Past Discoveries and New Techniques

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Summary

Over the years many sub-surface impact craters have been discovered through acquiring and interpreting seismic data. These cryptoexplosion events occurred a long time ago by meteorite impact and have since been buried deep underground. An overview will be given of some of these craters that have been discovered and their structural and economic value to the oil and gas industry. Using a known cryptoexplosion structure as an example, it will be shown how new processing techniques can improve our knowledge and understanding of these impact craters.

Theory and/or Method

New seismic processing techniques such as Divestco's SPRINT 6D interpolation (Ng et. al, 2015) and Diffraction Imaging (Edie et. al, 2014, 2015) will be applied to a vintage 3D dataset which displays a cryptoexplosion event to determine if new processing technology can improve our understanding of structurally complex sub-surface events.

SPRINT 6D improves on the existing MWNI interpolation technique and is designed to fill in missing data and/or up-sample the seismic data to improve its quality. Diffraction imaging is a technique that aims to preserve the diffracted energy within the data in order to image the fractures, faults and other discontinuities.

Examples

Figure 1 shows a pre-stack time migration amplitude time slice of the cryptoexplosion event. Note the rings and central uplift features that are associated with an impact crater structure, seen in the south part of the image. Approximately 70% of the structure is interpretable from the 3D outline.

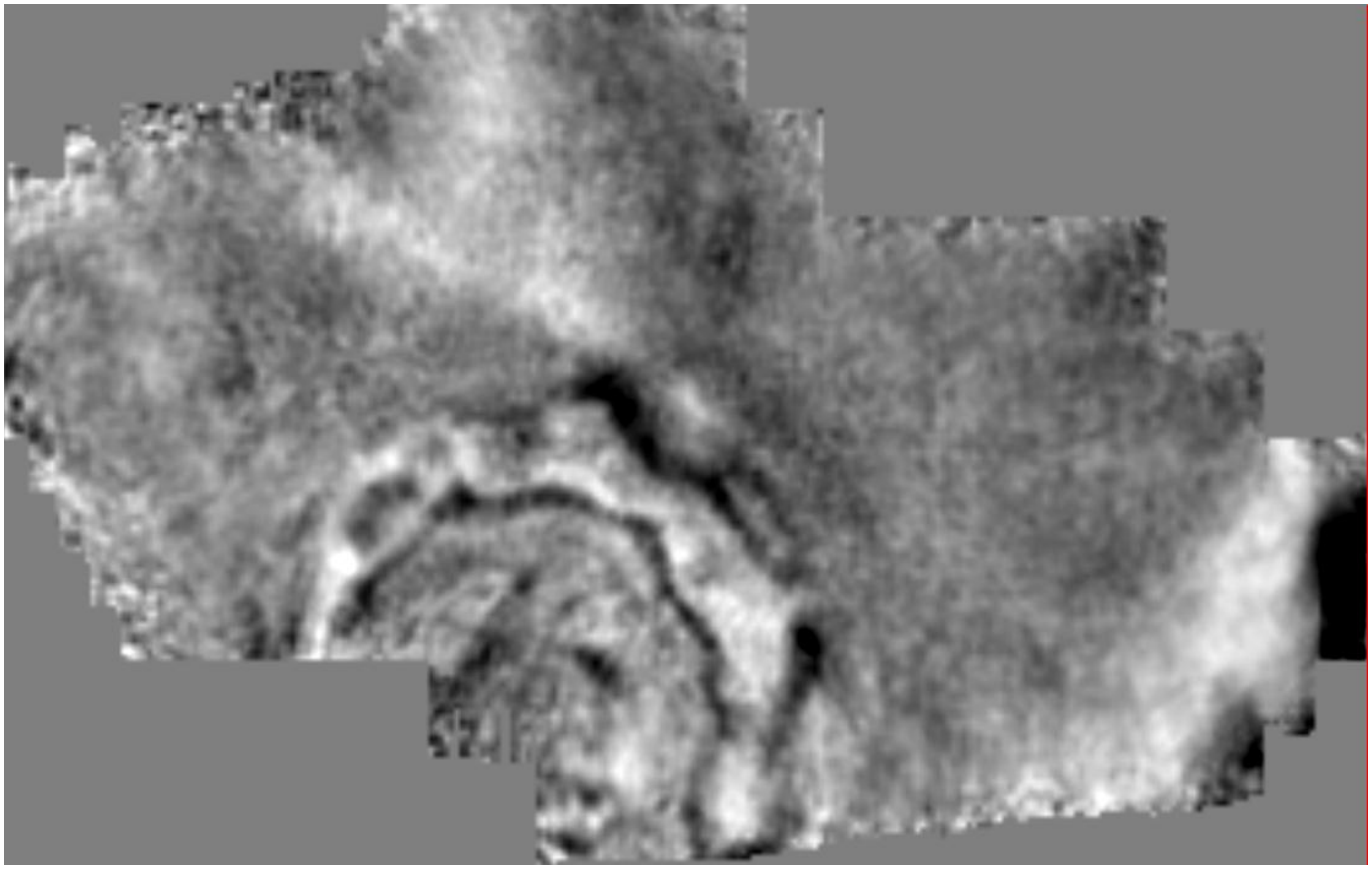

Figure 1. Pre-stack time migration amplitude time slice of cryptoexplosion event.

Acknowledgements

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