Land Electromagnetic Techniques for Prospect Identification, Evaluation and De-Risking

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"Land Magneto-Tellurics (MT) have been used in onshore oil and gas exploration around the world for around 50 years, typically in areas where seismic is not working as well as we would like. Its use has become more prevalent recently as other Electro Magnetic exploration usage has been more in the public eye particularly with the advent of its marine cousin technologies Marine MT and Controlled Source EM.

Land MT is often used in areas where there are nasty rocks close or near to surface such as salt, volcanics, basalts, carbonates etc and hence, the method is used in sub salt, sub basalt, sub volcanic and sub carbonate region around the world. The method is also very applicable in areas of complex structure such as overthrust zones where the seismic wavefront is often fully dispersed after passing through the first layer or two.

Areas of MT applications over the last 50 years include North and South America, Canada, Onshore Europe, Faroe Islands,the Middle east, Indian sub continent, Australia and the Far East and of course the FSU. Questions that MT can answer include things like:

How thick are the nasty rocks, where are they very thick and thin? What is their structural shape? How regionally and vertically extensive are they? What is under them...high resistivity other nasty rocks or nicer low resistivity prospective sedimentary section? What is the shape of the over-thrusts, what resistivity rocks are under them?

Modern MT when combined with new well to well, crosshole and well to surface techniques offers hope and promise for improved resolution and more effective 3-D solutions. This presentation will outline the method, how it works, talk about practical applications of the technique and show some intersting case study examples.