

EM for Geophysical Applications

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Introduction

Although in the search for hydrocarbons seismic plays the dominant role, complementary data can be very useful. A clear example is that seismic can clearly determine reservoir geometries based on acoustic impedance changes but is less sensitive to the pore-fluids. Electromagnetic measurements, such as Controlled Source EM (CSEM) measures resistivity directly and hence can discriminate between brine and hydrocarbon fill. But how about the poorer resolution of EM compared with seismic you might ask (correctly)! Indeed, that is the case, but if you think of combining the two independent sources of information, then seismic will give the structure (container) which then can be used as a constraint for the inversion of EM. Another application is in the realm of determining the shape of allochthonous salt bodies below which hydrocarbons can be present.

Numerous applications can be mentioned in relation to shallow seismic. An obvious one is the use of Ground Penetrating Radar for investigating archaeological sites or determining the depth to upwelling deep salt-water due to severe pumping of fresh water for irrigation.

Who should attend!

All those interested in understanding the use of Electromagnetic (EM) methods in Geophysical Applications. These are the geoscientists working in hydrocarbon exploration and exploitation as well as those applying shallow surface geophysics for detecting ore bodies, determining the extend of shallow pollution, foundation engineering, etc.

Learning, methods and tools

At the end of the course participants will have an idea how EM methods can be used in the search for hydrocarbons or investigating the shallow subsurface. The course uses a mixture of lectures, practical exercises and direct (workshop-like) participant involvement in discussions. The course can be customized to meet specific needs of participants.