

## **Geostatistical Inversion in Carbonate and Clastic Reservoirs: Oilfield Case Studies from Kuwait**

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### **Abstract**

This paper demonstrates the use of deterministic vs. geostatistical inversion, and illustrates the benefits of using geostatistical seismic inversion for reservoir characterization of two oil reservoirs in Kuwait: 1) the Ratawi Limestone carbonate reservoir and 2) the Wara sandstone clastic reservoir. In deterministic inversion, the inverted results are derived from integration of well data, interpolated for low frequency elastic impedance and the seismic data for the band-limited parts. This allows for capturing of reservoir bodies within one eighth of the wavelength. When the reservoir layers are thinner, the uncertainty of predicting the reservoir becomes higher due to the limitation of seismic bandwidth. Geostatistical inversion methods integrate the well log data, geological constraints, geostatistical parameters and seismic data (using Bayesian inference followed by Markov Chain Monte Carlo “MCMC” sampling) to produce a highly detailed reservoir description. The examples in this paper are from the Umm Gudair and Burgan Fields in southern Kuwait.