Summary
One of the main obstacles in obtaining good quality seismic images of the hydrocarbon reservoirs in the Middle East is the complex geology of the near surface. Indeed, an accurate characterization of the near surface is of primary importance, as unrealistic assumptions about the seismic velocity field generally yield erroneous results when the traditional seismic method is applied. In this study, geoelectric and seismic refraction data were integrated in an attempt to evaluate the resolution of this combination of methods for characterizing the complex geology of the near surface of an area on the Dammam dome, Saudi Arabia. The challenging difficulties inherent to the acquisition of geoelectric data in desert areas were overcome, so that high-quality datasets were obtained. The near surface electrical resistivity and seismic velocity variations were investigated by running surveys before and after the rain season at the test site. The estimated electrical resistivities and seismic velocities in the study area showed good correlation. The integration of the geoelectric and seismic methods allowed us to correlate the estimated geophysical models with the stratigraphy of the Rus Formation.

Introduction
It is well known that the quality of land seismic data from some regions in the Middle East can be affected by the complex geology of the near surface. Sand dunes, karsts, sabkhas, wadi fills, and shallow aquifers are some examples of the geological features that cause the kinematic and dynamic problems commonly observed in the seismic wavefield from this part of the subsurface. Different solutions have been proposed: some assume a slow lateral variation of the near-surface velocity (Bridle, 2007), others require a good starting velocity model in addition to expensive computational resources (Mulder and Plessix, 2006). We chose to investigate another approach: build on the integration of seismic data with different geophysical information. Thanks to recent technology improvements, acquisition and processing of thousands of geoelectric data is now feasible within short periods of time and using few human resources. These improvements render the integration of geoelectric and seismic data attractive.

Attempts have been made to improve the estimated geophysical parameters from geoelectric and seismic methods by using joint inversion algorithms (Hering et al., 1995). The main limitation of such techniques is the lack of an analytical relationship between electrical resitivities and seismic velocities. Correlations of such geophysical parameters in deep crust studies have been reported (Marquis and Hyndman, 1992). However, the geological near surface complexities in some areas of the Middle East represent a more challenging environment than any of these studies have dealt with. In addition, the traditional difficulty of acquiring geoelectric data in a desert environment must be overcome for a successful study. It is well known that when the ground resistance contact of the electrodes is not properly reduced, the quality of the data is highly degraded.

Geoelectric and 3C seismic data were acquired with the following objectives: (1) Evaluate the resolution of the geoelectric method compared with the seismic refraction method in an area with a complex near surface. (2) Look for potential correlation between the distributed electrical resistivities and the seismic velocities. (3) Estimate the integration of the geoelectric and seismic refraction method as an alternative to characterize a complex near surface of the Dammam dome area.

Results of a time-lapse study of the geoelectric and seismic refraction methods conducted before and after the rain season in Saudi Arabia are presented. The inverted electrical resistivities and seismic velocities are integrated to obtain a geophysical description of the stratigraphic features of the complicated near surface in this part of the world.

Geological Setting
The study area is situated on the southeastern flank of the Dammam dome, a 155-km^2 structural hydrocarbon trap that is part of the Dammam Peninsula, in the Saudi Arabia Eastern