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Case Study of High-Resolution Marine Seismic Survey in Shallow Water, Arabian Gulf, Saudi Arabia

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Abstract : High-resolution marine seismic survey is a well-established technique that commonly used to characterize near-surface sediments and geological structures at shallow water. We conduct single channel seismic survey to provide high quality seismic images for near-surface sediments upto 100m depth at Jubal costal area, Arabian Gulf. Eight hydrophones streamer has been used to collect stacked seismic traces alone 5km seismic line. To reach the required depth, we have used spark system that discharges energies above 5000 J with expected frequency output span the range from 200 to 2000 Hz. A suitable processing flow implemented to enhance the signal-to-noise ratio of the seismic profile. We have found that shallow sedimentary layers at the study site have complex pattern of reflectivity, which decay significantly due to amount of source energy used as well as the multiples associated to seafloor. In fact, the results reveal that single channel marine seismic at shallow water is a cost-effective technique that can be easily repeated to observe any possibly changes in the wave physical properties at the near surface layers

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