

Advanced Well Logging across Crust-Mantle Transition in Oman

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To clarify the mohole discontinuity which was first identified in 1909 as step in the velocity of the seismic wave, it is necessary to drill and sample across crustal-mantle transition and that was original idea of the scientific ocean drilling more than four decades ago. This study is aiming to maximize the understanding on the petrophysical, geophysical, petrological and chemical nature across crustal-mantle transition, and to support in realistic planning for D/V Chikyu drilling and sampling fresh mantle in the future.

Under the International Continental Drilling Program (ICDP) support and guidelines, core samples from the crust-mantle (CM) boundary were taken in the Phase II (Nov., 2017-Jan., 2018). In addition, drilling parameters were monitored and recorded from two CM sites with cooperation from the drilling companies, and most advanced well logging was carried out to the depths where logging tools could reach.

Schlumberger' s wireline logging acquired high-resolution and continuous density-porosity, natural and spectral gamma, resistivity and its images, sonic velocity (P & S waves), and geochemical logs (elements and minerals). Preliminary results of acquired and processed well logging data across crust-mantle transition will be presented and plan for the data integration studies will be discussed. As first ever geophysical site survey taken from one of three offshore Mohole targets recently, potential application of Oman study results in the planning offshore Mohole to Mantle drilling (M2M) will also be introduced.

Keywords: Oman Drilling Project, Crust-Mantle Boundary, Well Logging, ICDP

