

# High-resolution Petrophysical, Geophysical & Chemical Properties Characterization across Crustal-Mantle Transition in Oman

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To clarify the actual condition of 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 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.

Since the full proposal approved in 2014 and overcoming some delays, Oman drilling operations began in early December, 2016 in the Samail Ophiolite, the largest and best-exposed section of oceanic crust and upper mantle in the World. Among several sites to drill, core, log and experiment, this study targets at the crustal-mantle transition site to collect as much data and sample as possible. Hence, two wells are planned to drill up to 600 m where slim well is for the high quality coring and slim wireline logging, and rotary well is for conventional logging with most advanced tools in the industry. In addition to the scientific core measurements onboard Chikyu, core scratch test will carry out to collect continuous high resolution rock strength (UCS), wireline logging will take various petrophysical measurements from slim logging tools and density-porosity, resistivity image, sonic velocity and various element-mineralogy data from the most advanced logging tool from industry.

As part of the “drilling informatics science” that Center for Ocean Drilling Science is working for three years, all geological samples and petrophysical, chemical and geophysical logging data are planned to process, analyze and integrate to achieve world's first high-resolution petrophysical and chemical properties across the Mohole transition.

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