
 [EE] Evening Poster | S (Solid Earth Sciences) | S-CG Complex & General

[S-CG54]Hard-Rock Drilling: Oman to Oceanic Lithosphere to Island Arc Formation and Beyond

convener: Eiichi TAKAZAWA (Department of Geology, Faculty of Science, Niigata University), Katsuyoshi Michibayashi (Department of Earth and Planetary Sciences, Nagoya University), Peter B Kelemen (共同), Damon A H Teagle (Ocean & Earth Science, National Oceanography Centre Southampton, University of Southampton, SO14-3ZH, Southampton, UK)

Mon. May 21, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall 7, Makuhari Messe)

The on-going Oman Drilling Project (OmDP) has drilled numerous hard-rock cores of ancient oceanic lithosphere and the underlying subduction zone of the Samail ophiolite in Oman, with support from ICDP, IODP, the Sloan Foundation's Deep Carbon Observatory, and Japanese, US, and European research agencies. Moreover, a number of IODP expeditions have focused on hard-rock drilling over the last 5 years including Expedition 352 in 2014, which drilled the volcanic sequence associated with subduction initiation in the Bonin fore-arc, Expedition 357, which drilled the Lost City hydrothermal field, Expedition 360, which drilled the lithosphere associated with ultraslow-spreading at the Southwest Indian Ridge in 2016, and Expedition 366, which drilled the serpentinite seamounts in the Mariana fore-arc. In this session, we invite presentations on the scientific results of hard-rock drilling at these and other sites. We also invite related presentations on oceanic lithosphere, island arc formation, and any other significant issue that could be addressed by future hard-rock drilling. This includes marine studies of oceanic lithosphere and on-land geological investigations of ophiolites, accreted arcs, and subduction complexes. The session is intended to be interdisciplinary, including the fields of geophysics, geochemistry, petrology, engineering, and biology.

[SCG54-P09] Overview of Hole CM2 in the Oman Drilling Project Phase 2: the Moho transition zone to the uppermost mantle

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Keywords: Oman, Mantle, Moho Transition Zone, dunite, gabbro, peridotite

Hole CM2B was drilled by the Oman Drilling Project (OmDP) into Wadi Nassif of the Samail ophiolite, Oman. OmDP is an international collaboration supported by the International Continental Scientific Drilling Program, the Deep Carbon Observatory, NSF, IODP, JAMSTEC, and the European, Japanese, German and Swiss Science Foundations, with in-kind support in Oman from the Ministry of Regional Municipalities and Water Resources, Public Authority of Mining, and Sultan Qaboos University. Hole CM2B was diamond cored in December 2017 to January 2018 to a total depth of 300 m. The outer surfaces of the cores were imaged and described on site before being curated, boxed and shipped to the IODP drill ship Chikyu, where they will undergo comprehensive visual and instrumental analysis.

Hole CM2B recovered predominantly dunites, gabbros and harzburgites and has been sub-divided into two sections: the Moho transition zone (MTZ: mostly dunites with some gabbroic layers and minor harzburgite layers) and the mantle. The MTZ occurs from 0 to ca. 140 m and the mantle (mostly harzburgites) is from ca. 140 to 300 m.

The dunites were logged as moderately to intensely serpentinized cores, although coarse granular textures were still observed. A few chromite layers occur at around 115 m. Gabbroic layers commonly have hydrous minerals. The first harzburgite layer was logged at ca. 120m. Harzburgites in the mantle section were logged as moderately to intensely serpentinized cores with locally less serpentinized conditions. They show dominantly coarse granular textures and foliations defined by mineral shapes can be observed.