

## In-situ measurement of the lower crust and upper mantle lithology in Atlantis Bank - Results from YOKOSUKA ABCDE Cruise -

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YOKOSUKA ABCDE Cruise (cruise ID = YK01-14) was carried out from 20th December 2001 until 27th January 2002 to explore Atlantis Bank, Southwest Indian Ridge by submersible SHINKAI6500. Scientific targets of the expedition were focussed on testing the ophiolite model for the stratigraphy of the lower crust and mantle, the nature and evolution of the crust-mantle boundary, and determination of the lateral chemical and physical heterogeneity of the lower ocean crust in space and time. Total 13 dives by Submersible SHINKAI6500 was completed during the cruise at the southwestern slope, southern slope, middle to northern part of the eastern wall and northwestern slope to complement the previous dive expeditions in 1998 and 2000. The southwestern slope of Atlantis Bank was selected to provide the best opportunity for the purpose of surveying the lithology around the petrologic Moho after consideration of the transect of thick mantle peridotite sections by the ROV KAIKO during the KR00-06 Expedition near the Atlantis Bank gabbro massif. Finally, both unaltered peridotite rocks were collected on the lower part primitive gabbroic rocks on the upper part of the transect, suggesting the existence of the petrologic Moho around the site of 2600m in water depth at the southern end of Atlantis Bank. During the expedition, Atlantis Bank was completely re-surveyed under the unusually good sea conditions in order to produce a precise topographic map without bathymetric errors. The new map shows several new ridge-parallel faults cutting the bank, numerous large slumps of the surface towards the fracture zone etc. A regional geophysical survey (topography, gravity and geomagnetism) was carried out at night after diving. The main target for the survey was the ridge segment immediately west of the Atlantis-II Fracture Zone.