Preliminary report on geology and petrology of Atlantis Bank along the Atlantis II Fracture Zone, Southwest Indian Ocean

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Atlantis Bank is located along the eastern part of the Atlantis II Transform on the Southwest Indian Ridge. Drilling at the summit of a flat-topped massif has recovered about 1500 m thick gabbro succession during the course of two ODP legs. From the end of last year to this year (2002), thirteen submersible dives by Shinkai 6500 were carried out during YK01-14 cruise. Besides ten submersible dives by Shinkai 6500 were done at 1998 during MODE'98 Leg 4 and three submersible dives by Kaiko at 2000 during KR00-06 cruise of MODE2000. Thus, Atlantis bank became to the most intensively studied area of very slow-spread crust-mantle succession.

Followings are main results during above three cruses. 1) Geological mapping was completed for the area about 50 km long and 15 km wide, which enable us to construct three-dimensional structures of Atlantis Bank in terms of lithological and structural features. 2) Sheeted dike complex was firstly found from this area along the north-eastern cliff. 3) Mantle-crust transitions were observed at several places. Dunite was obtained from outcrop for the first time near the mantle-crust transition. 4) Regional and vertical variations in lithology of gabbro layer were observed. Rhythmic layered gabbros were well observed for the first time near the mantle-crust transition.

We present preliminary results obtained from YK01-14 cruise and discuss with the significance in terms of structures of slow-spread oceanic crust and mantle.