

# Topography and surficial geology around the Sumisu shima and Tori shima - Preliminary report of R/V KAIYO cruise, KY03-10

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Program for geochemical evolution, IFREE, JAMSTEC is researching the Sumisu shima and Tori shima areas, using SHINKAI 2000 and other JAMSTEC research instruments from 2002. In September 2003, we carried out Deep Tow Camera and other survey using R/V KAIYO in the Sumisu and Tori shima areas. We report the preliminary results of the bathymetry, Deep Tow and Sea BEAM side scan, and other surveys which combined with previous research cruises results.

One of the prominent features around the Sumisu shima area is the Sumisu caldera, which has about 9 km width. Several parasitic volcanos like knolls accompany the caldera. Some of the knolls, like Dai-ni Sumisu knoll, show high backscattering intensity and seems composed of lava or coarse-grained fragments. The other prominent feature is concentric wavy landslide topography that is surrounding the Sumisu caldera. This feature is already drowned in the previous bathymetric map published by JHD in 1997. However according to our survey, the area of this wavy landslide very large and extend to the Sumisu basin in the western side and out side of survey area in the eastern side.

One deep Tow side scan sonar line run across the caldera. On the record, the flat portion of the caldera floor shows high backscattering intensity. Its correlates the SHINKAI dive of 2002 result that fine-grained sediments covered the floor. Some small knolls exist within the caldera. Most of these knolls show comparatively low backscattering intensity. On the one of these knolls floor, lava and hard rock outcrops were observed by SHINKAI dive 1017 (Iwabuchi, 1999). One of these small knolls, which located in the central part of the caldera floor, shows low backscattering intensity. SHINKAI Dive 1392 observed sandy sediments on the surface and well correlate the sonar record.

Tori shima seamount has about 8km wide caldera and Tori shima is located on the southern rim of the caldera. This caldera western side seems not clear and the boundary between about 5 km wide central knolls is not clear. The irregular sharp central knoll and the inner wall of the caldera probably are composed of solidified outcrop or covered with coarse-grained materials. The Tori shima seamount is also accompanied with several parasitic volcanos like knolls. Some of these knolls, like Torishima knoll, show comparatively high backscattering intensity distributed radically from the crest. Therefore, the surface of these knoll covered by coarse-grained materials (probably scoriaceous). On the other hand, Dai-chi Torishima knoll, which exist on the southeastern side of the Tori shima seamount, has reversed triangle sharp flat topped bank like crest summit. This flat-topped summit covered by comparatively thick stratified sediments, so, this knoll is comparatively old structural high.

The upper portion of the outer side of the cladera slope shows comparatively high backscattering intensity and seems covered by coarse-grained materials or hard rock outcrop. The lower portion shows comparatively low backscattering intensity and show the wavy concentric landslide topography which similar to the Sumisu caldera outer slope.