Verification of Surface Sediment Physical Properties at Okinawa Trough

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A research cruise to have a direct analysis of hot pore water from the subseafloor microbe area (KR01-09) was carried out at the southern and the central parts of the Okinawa Trough in 2001. During the cruise, we tried to sample the sediments by piston and gravity corers. We have measured various physical properties for the six sediments cores that were collected successfully by piston corer. At first, we carried out the non-destruction physical properties measurement with Multi-Sensor Core Logger of Marine Science and Technology, Tokai University. Secondly, we measured the volume by Penta-Pycnometer and the mass by precision balance for 7cc cube sediments sample, which were, collected every 2cm interval. Bulk Density, Grain Density, Porosity and Water Content have been calculated from these measurements.

Because of preservation and transportation, these measurements were operated about 1 month after the collection. Consequently, the provided physical properties may not have been reflected precisely the state just after collection for the reason of the evaporation. Therefore we tried to clarify how much evaporation affected the Tokai samples in by comparing with measured value of a sample that was sampled in different time by Fukada Geological Instrument, FGI. FGI sampled during the cruise from the same piston core same as what we used and gathered a cube sample. FGI measured the mass with a precision balance and calculated bulk density, porosity and water content for these samples, supposing the volume was 7cc. To compare water contents of the sediments, it is necessary to take into account the free water and pore water contents. We had paid attention to the free water in this time. Because the water content is calculated only by the mass measurement.

As a result of comparison of water contents of between FGI and Tokai University, it was found that there was maximum 10% difference between them. In addition, the value of Tokai University measurement was lower than those of FGI at all measurement points except some sections. Probably there was the influence water evaporation. We used the result and revised water contents about other physical properties of Tokai University and got the physical properties that might be nearer to the state just after collection. We report about details that compare with those collected physical properties with lithofacies.