伊是名海穴での掘削コアと検層の対比：「ちきゅう」掘削CK16-05
A correlation between logging and drilled cores at Izena Hole: CK16-05 D/V *Chikyu* drilling

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During CK16-05 cruise, a set of drilled cores including sulfide-rich zones was obtained from Izena Hole (Kumagai et al., 2017), coupled with continuous logging profiles of natural gamma-ray using simplified memory-type geothermal logging tool, PPS71^{TM} at the selected sites. At preceding two drilling expeditions, Logging-while-drilling (LWD) technique were applied; however, the system applied were rather complicated and required additional staffing to be operated. That is why LWD has not applied in the latest expedition. Avoiding the borehole collapse and tool stack, the standard wire-line logging was neither applied; alternatively, the tool situated the bottom of the drill strings was pull-up with them from the bottom of the borehole. Although a natural gamma-ray detector was limitedly installed in the tool, the continuous profiles were successfully obtained (Kitada et al., 2017). In the expedition, mostly continuous coring strategy was applied: total penetration of the holes exceeds 800m. As in the usual case of the drilling near the active hydrothermal vent areas, retrieval of cores were poor especially in the deeper part of the holes. The core-recovery rate throughout the expedition was almost half of the penetration (~49%); however, the shallower part cored by hydraulic piston coring method reached almost full (~100%). On the other hand, those of deeper part not applying hydraulic piston coring was limited in lower than 10 %.

Thus we tried an integrated interpretation between cored samples and logging data as follows: 1) reconsideration of identification of lithological units defined on-board, focusing sedimentation structures, 2) modification of the proposed units according to the physical properties and geochemical compositions determined for discrete samples, and 3) comparison with continuous logging profiles of natural gamma ray intensities and adjust the depth of the lithological boundaries. During the third step of this integration, units having significant thickness > 10m or showing distinctive changes of densities and P-wave velocities were carefully identified for further integration with results of seismic surveys. In our investigation, not only upper and lower boundaries of sulfide-rich zones but also those between normal hemipelagic sediments and turbidites and those with silicified zones were commonly identified. It is expected to be recognized in seismic cross section profiles under optimized high resolution survey.

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