Earthquake-induced submarine sliding in the Pleistocene trench-slope-basin sediment, central Japan: comparative study between geological and physical model

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Abstract

Submarine slides, which commonly develop along subduction margins, have recently been recognized as one of the most serious geohazards. A large-scale chaotically mixed sedimentary body exposed in the Pleistocene Chikura Group, central Japan is the ancient examples of submarine sliding which was triggered by earthquake-induced liquefaction occurred approximately 2 Ma. Although the deposit can be traceable over 5 km based on the key-tephra (HF) tracing, we identified the evidence of lateral variation of sliding ages. In the central part, coherent layers and the key tephra (HF) overlay the slide deposit (HF overlays about 4 meters above the top of the slide sediment). In the westernmost part, however, the HF was included inside the slide deposits as blocks. The HF overlays about 2 meters above the slide deposit in the intermediate part. Based on the sandbox-based physical model (Yamada et al., in press\(^?\)), the significant failure patterns can be identified: (1) the small-scale and frequent slope failure (Type I slides) act as precursors of large-scale but less frequent failure (Type II slides); (2) Each slope failure produces a topographic undulation, triggering events in adjacent areas and a lateral migration of discrete slope failures. This presentation will show the geologic architectures of earthquake-induced submarine sliding (liquefied sediment flow) and lateral migration patterns of sliding based on physical models.