Lateral and vertical sequence of submarine landslide at subduction margins: geological and physical model

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Two ancient examples of submarine landslides exposed in the Pleistocene Chikura Group and middle Miocene Hota Group will be presented in this presentation, which would be able to correspond with the physical model reported by Yamada et al., (in this session). The former example represents the lateral migration of intermittent submarine land slide, whereas the latter example possibly show the land-slide sequence that some minor-land slide occurred precursory of following major sliding, respectively; both are identified in the physical model.

The submarine landslide in the Pleistocene Chikura Group 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. This is the geologic evidence indicative of the lateral migration of submarine landslides, also identified in the physical models (Yamada et al., in this session).

Another example was identified in the middle Miocene Hota accretionary complex. At least 4 layers of failed deposits (three minor-scale deposit and a large-scale deposit at the top) developed immediately below a major thrust fault. The top conglomerate, far thick with larger clasts, possibly formed as Type II slope failure in the analogue model. The uppermost boundary of the layer bounded by the major thrust fault also shows a geometric character similar to the model results. The lower three thinner conglomerate layers, in contrast, compose of smaller clasts without carbonate-cemented rocks, suggest that these are formed by slope failures limited in the footwall and may correspond to Type I failures observed in the models.