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Experiments of micro-delta shape and sediment transport mode

Taro Suzuki[1*], Noritaka Endo[1]

[1]Kanazawa University

The previous studies showed that the shape of the foreset face of a delta depends on various factors such as flow discharge, the ratio of depths at bottomset and topset, properties of sediment particle (size, denisity) and sediment supply rate. Most of the previous experimental studies considered the constant control parameters, although those always change in the natural setting. In the present study, we investigated the relation between the shape (longitudinal section) of the delta and sediment transport mode under the conditions of oscillatory change in flow discharge and/or sediment supply rate, utilizing a 2-D small flume. The results showed that in addition to some features similar to those in the constant conditions, there appeared specific characters that did not occur under the constant conditions; (1) erosion on the topset when increasing the flow discharge (2) occurrence of density flow, and its deposition on the lower part of the foreset (3) formation of cross laminations caused by the oscillatory change in flow discharge and, when the flow discharge is relatively low, by oscillatory change in sediment supply (4) shape of delta depends on the period of the oscillatory change in flow discharge (5) the ratio of sedimentation rates at the bottomset to at the foreset increases with decreasing the period of oscillatory change in flow discharge, the tendency of which became strong with the increase in sediment supply rate.

Keywords: micro-delta, flume experiment, sediment transport mode, cross lamination