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# デルタシステムにおける流量の変化に対応するボトムセットの輸送様式変化：水槽実験
# Flume experiments on the change of transport mode on the bottomset in delta system: the response to flow discharge

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In delta system, the muddy sediment on the bottomset are interpreted as what was transported by (A) low density suspension load (Nishida et al., 2010) or (B) high concentrated flow such as hyperpycnal flows caused by a river of flood (Normark and Piper, 1991; Sasaki, 2010) and fluid mud (Nishida et al., 2010). To understand the formative mechanics of delta topographies, it is useful to conduct flume experiments dealing with each individual elements of processes. In this study, we performed experiments of micro-delta system to investigate the change of sediment transport mode on the bottomset and its dependence on the .increase rate of discharge.

The experimental flume was 1 m long, 15 cm deep and 2.5 cm wide, and was designed to assume a 2-D system between river ? still water area. Used sediment was silt (mean density 2.2 g/cm{3}, median diameter 37.8 micrometer, mode diameter 48.8 micrometer). We limited runs into the cases that the sediment transport modes on the topset were bedload sheet (Reesink and Bridge, 2007, 2010). In each run, the water depth on the topset changes according to flow discharge spontaneously. The observation area was set to be 50 cm downstream from the supply point of mixture of water and silt to take account of erosion of topset when the water discharge increases. The initial flow discharge was set 200 ml/min at which the sediment supplied from topset deposited only on foreset by turbidity currents.

In this study, both modes of sedimentation process corresponding to the above were observed from (A) low density suspension and (B) high concentrated flow. Sedimentation from low density suspension was previously reported in experimental runs at high constant flow discharge (600 ml/min) (Suzuki and Endo, 2010). Here we observed that similar processes occurred under waxing flows at low increase rate when the flow became high discharge. At this time, the shape of foreset became steep slope and ’angular contact (Jopling, 1965).’ It was found that only at high increase rate of flow discharge, high concentrated flow occurred due to topset erosion and the sediment deposited onto the foreset and bottomset. At this time, the shape of foreset became gentle slope and ’tangential contact (Jopling, 1965).’