

Relationship between three-dimensional grain fabrics and depositional processes in experimental deltas using rice grains

Naofumi Yamaguchi[1]; Fujio Masuda[2]

[1] Earth and Planetary Sci., Kyoto Univ.; [2] Dept. Geol. and Mineral., Grad. Sci., Kyoto Univ.

This study used rice grains as clastics in flume experiments to analyze three-dimensional grain fabrics, both imbrication and orientation, in microdelta deposits under three sets of hydraulic conditions. Two predominant fabrics were observed at middle depths in the microdelta deposits (1) grains oriented parallel to the current direction with an imbrication angle near to the foreset dip angle, and (2) grains with random orientation and horizontal imbrication. The first type of fabric appears in grains that have first settled on the uppermost lee slope, and have subsequently been relocated and reoriented by discontinuous grain flows (avalanches). The second type of fabric appears in grains that have dropped over the full length of the lee slope, and have not been relocated or reoriented by later grain-flow events. A large number of grains in the zone between topset and foreset beds were of intermediate- or transverse- type orientation, which reflects a lack of influence of grain flow on these sediments. The results of this study suggest that the characteristics of three-dimensional grain fabrics contain considerable data that can help in the understanding of depositional processes.