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Kyung Sik Choi[1], Robert W. Dalrymple[1], Sung Pil Kim[2], Yong Ahn Park[3], Seung Soo Chun[4]
(1) Queen's University, Kingston, ON (2) Korea Institute of Geology, Mining and Materials, Daejon, South Korea (3) Seoul National University, Seoul, South Korea (4) Chonnam National University, Kwangju, South Korea

Sedimentology of Modern, Inclined Heterolithic Stratification from the Tide-dominated, Han River Delta, Korea

An inclined heterolithic stratification (IHS) was described from the mud flat fringing estuarine macrotidal (spring tidal range up to 9 m) channel near Han River delta, Korea. The mud flat demonstrates a convex-upward profile with intermittent presence of cliffs and terraces. The vertical succession of IHS above mean low water level is approximately 6 m thick and dips into the channel with angles ranging from 5-15 degree. The succession consists of lower cross- to parallel laminated sandy silt facies and upper parallel laminated silt facies with distinctive fining-upward textural trend. Each lamina, comprising IHS, grades from coarse silt at the base to fine silt to mud at the top, which was formed during a tidal cycle. The laminated sandy silt and silt facies exhibit tidal rhythmicities ranging from daily to monthly, indicating very rapid sedimentation rate of as much as 5 cm/month. Fining-upward texture and the presence of tidal rhythmites as well as a convex-upward profile strongly indicate the progradation and aggradation of the tidal flat, which contrasts to other Korean tidal flats that are mostly retrograding. Geomorphological setting and proximity to sediment source (Han River) might facilitate the growth of the tidal flat. Intermittent appearance of cliffs and terraces together with concave-up truncation surface, however, suggests that erosional process becomes temporarily significant. The periodicity and the origin of the erosional events await further studies.