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morphology and sedimentation

Observations of self-accelerating turbidity currents in the Xiaolangdi reservoir, Yellow River, China

Ž 1.2

2 2 1.8 (m/s)

S 1.6

 $\widehat{\mathbf{s}}^{1.2}$ 8.0 É. 0.0 = 0.6×0.4 M 0.2







3. Velocity, Concentration and thickness



4. Summary

The spatiotemporal span of self-acceleration is markedly long;

Two types of self-acceleration have been observed: one close to the plunging point, where the mixed fluvial sediment-laden flow collapses into a stratified turbidity current layer, thus focusing momentum from the whole water column into a thin layer and resulting in acceleration, and the other one where the turbidity current flow encounters a local enhancement in bed slope;

Instead of producing denser sediment concentration, the acceleration process of the turbidity current tend to induce a thicker layer of the flow along the path, indicating spontaneous entrainment of sediment and ambient fluid.

Reference

S. Chamoun, G. De Cesare, A. J. Schleiss, Managing reservoir sedimentation by venting turbidity currents: A review. International Journal of Sediment Research 31, 195-204 (2016).