stochastic sediment transport modeling

annotated bibliography

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This annotated bibliography is in preparation of a publication of a high resolution sediment transport dataset alongside a new sediment transport theory based upon Markov random process theory. As such the bibliography contains papers from three categories: (1) similar sediment transport experiments; (2) applied mathematics and computer vision papers relating to experiment analysis; and (3) papers on stochastic sediment transport theory.

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annotations:

[1] S. Abbott and S. Francis, "Saltation and suspension trajectories of solid grains in a water stream," *Royal Transations of the Royal Society of London A.*, vol. 294, no. 1321, pp. 225–254, 1977.

This is the followup paper to Francis (1973) which is probably the earliest photography based experiment resolving sediment transport characteristics in a water stream. The authors take many thousands of photos to obtain positions, velocities, and accelerations of bed and wash load particles within a flume. They discriminate position and velocity components into modes of motion (as in rolling, sliding, suspended). Wide variation is noted, but the dataset is too small to access distributions of velocity or acceleration. This paper is significant, but much like Shields (1936) its significance has become entirely historical as its database contribution is completely overshadowed by modern datasets (see Heyman et al. (2016)).

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