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The main types of river channel bedforms movement

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There are two main types of movement of bedforms in the river channel. Active bedforms are three-dimensional, symmetrical, with gentle slopes. They move without significant change in shape, since all parts of their surface move at the same celerity. Passive bedforms are two-dimensional, asymmetric, with steep leeward slope. Bedform top moves faster than hollow and bedform deform, skew.

Bedforms are usually organised into hierarchical complexes in the river channels, where smaller bedforms move along the surface of larger ones. With active movement, the morphology and dynamics of bedforms of different orders in the hierarchy are relatively independent. The relationships between bedforms of different orders is increasing in the case of passive movement.

Bed load transport in the river channel depends on the type of bedforms movement. In the case of active bedforms, bedload transport rate, computed with their morphology and celerity, is different for different bedform orders. The total bedload transport rate is equal then to the sum of bedload transportation by bedforms of different orders, plus sediments transit. In the case of passive movement, the total bedload transport rate is equal to bedload transportation by bedforms with steep leeward slopes and complete deposition there of all incoming sediments. Then it is possible to use Exner's equation of deformation for estimating of bedload transport rate.

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