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Theoretical bed in bed load laden flow

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In mountain stream, theoretical bed level is important to evaluate tractive force acting on sediment because of the small flow-depth sediment-size ratio. In case of debris flow, the theoretical bed level is given by the condition in balance of external shear stress with Coulomb friction, according to Egashira et al. We tried to apply the concept to bed load laden flow. As the result, we found as follows. (1) The thickness of sediment moving layer is proportional to non-dimensional tractive force, and almost same as the maximum salutation height of sediment particles. (2) Non-dimensional tractive force is taken the value about 0.2, when the thickness of sediment moving layer is same as the sediment diameter. (3) The value of non-dimensional tractive force may slightly change by the channel slope, and may decrease, as the channel is steeper. (4) Non-dimensional critical tractive force may also decrease, as the channel is steeper.