Numerical simulation of sediment transport in shallow water equations.

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Sediment can be defined as a fragmented material from rocks that has been formed by different physical and/or chemical process. Due to the action of a river, sediment may be transported in three ways: bedload, saltation and suspension. Here we are mainly interested in bedload and suspension transport process caused by the movement of a fluid in contact with the sediment layer.

Some models have already been proposed for the simulation of bedload sediment transport. These models usually consist on a coupled model constituted by a hydrodynamical component, modeled by Shallow Water equations, and a morphodynamical component, modeled by some solid transport flux. Among the most used solid transport flux, we find the ones proposed by Grass [3], Meyer-Peter & Müller [5], Van Rijn [8], etc. They usually give good results but they neglect gravity effects and may present some other problems.

Suspension transport can be modeled by extending the ideas presented in the works of [7], [4] and [1].

In [6] a new model was introduced that consider both suspension and bedload transport. This model can be solved using path-conservative schemes described by Parés *et al.* and the solid transport flux can be generalized by using the ideas proposed by [2] so that gravity effects are also considered

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