

On the modelling of dry granular flows on narrow channels via a $\mu(I)$ rheology multilayer shallow model

J. Garres-Díaz - Universidad de Sevilla

Abstract

In this talk we present a multilayer $\mu(I)$ rheology model, which considers the variation of the velocity field in the normal direction. This vertical structure is essential in the case of granular flows to obtain an accurate approximation of the rheological and friction terms. In addition, the proposed model takes into account the sidewalls friction through an asymptotic analysis and under the hypothesis of a one-dimensional flow. On the other hand, one of the main difficulties of this model is the numerical treatment of both, the bottom condition and the rheological terms at the same time. We propose a well-balanced finite volume scheme based on the combination of a semi-implicit discretization of the rheological terms and a hydrostatic reconstruction. Finally, some numerical tests are presented.