



## **Application of a debris flow 2D model to a mudflow event in the Sambuco basin.**

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In the last years a debris flow bidimensional model (FLATModel) has been developed at GITS (Sediment Transport Research Group) at the DEHMA, Hydraulic, Marine and Environmental Department of the UPC. This model has been presented in the DFHM4 and several test cases were analyzed. The common characteristic of these events was the granular rheology, a Voellmy or Coulomb model fits the behavior of the flows. To extend the capacities of the model, mudflow rheologies have been implemented (Bingham, Herschel-Bulkley) and a test cases have been selected in the Sambuco basin. The existence of urban areas in the fans needs the inclusion of structures in the model to improve the quality of the results. From the numerical point of view, the challenges come from the fact that high resolution LIDAR topography is necessary to capture the urban area details, and also the extremely high velocities reduce the stability of the model. All those characteristics require the use of a parallel version of the model running in a computational cluster.