



## **A new rheometer for mud and debris flows**

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The paper deals with the innovation of laboratory experimental techniques aimed at determining the viscous properties of materials that are produced during fast landslides type mud and debris flows. The knowledge of their rheological properties can assess areas of invasion and then the travel distance and the velocity that may danger and damage persons or properties.

The new equipment is a drag ball rheometer defined SDR (Sphere Drag Rheometer) firstly introduced by Schatzmann. Unlike standard fluid rheometers the new system uses much higher volume of mixtures of appropriate size and then, next to the real. We report the results of calibration of the SDR with Newtonian (silicon oil at different viscosity) and Non-Newtonian standard fluid (hair gel and tomato sauce) and some rheological behaviour of reconstituted pyroclastic mixture of debris flows occurred in Campania Region, Italy. The mixtures were reconstituted at different volumetric solid concentrations and different grain size distributions and maximum diameter of soil particles. The results are compared with those obtained by conventional rheometers and inclined plane tests conducted at the Laboratoire Navier in France during previous experimental activities.