

Study of viscous debris-flow surges moving on a residual layer in a flume

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Abstract Debris flows are observed as a series of surges in nature and are characterized as rolling waves. A residual layer plays a vital role during the movement of surges. This paper examines debris flow surges in a flume to study the mass exchange between the surge front and the residual layer. Initial findings show that the surge head incorporates materials from the residual layer in a rolling way. The ratio of mass exchange increases linearly with mean flow velocity and mass exchange has an impact on the resistance coefficient.

Key words debris-flow surge; head of surge; residual layer; mass exchange; flume