



The Thurwieser rock avalanche, Ortles-Cevedale Group (Italian Alps): description and dynamic analysis

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The Thurwieser rock avalanche occurred on September 18th, 2004 in Zebrù Valley, near Santa Caterina Valfurva (Italy). The detachment area is located at an approximate elevation of 3600 m a.s.l. on the east face of Punta Thurwieser, just below its top. The estimated overall volume of the landslide is $2.5 \times 10^6 \text{ m}^3$. The rock avalanche dropped and partly moved on the surface of the underlying Zebrù Glacier; after crossing a high rock step, the rock mass flew along the narrow Rin Mare valley stopping at an elevation of about 2235 m a.s.l. The overall runout was about 3000 m.

The permafrost degradation is supposed to be the most probable triggering factor. Similar phenomena, even with lower volumes, have been occurring since summer 2003 in the Alps (Bernina, Matterhorn, Mont Blanc) following periods of exceptionally high temperatures.

The landslide dynamics have been numerically back analysed with the fluid dynamic model "RASH-3D", based on a numerical solution of the St. Venant's equation.

Preliminary analyses carried out by assuming typical values of rock mass friction angle strongly underestimated the runout. In order to explain the unexpectedly high runout of the landslide, it is necessary to model the flow on the glacier surface by assuming a reduced value of basal friction angle.