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Movement rates and ground thermal regimes of solifluction lobes in the Hohe Tauern Range, Austria, between 2006 and 2010

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Solifluction represents in modern scientific usage collectively slow mass wasting associated with freeze-thaw action occurring in periglacial environments. Solifluction is classified into needle ice creep, frost creep, gelifluction (i.e. movement of saturated soil associated with ground thawing) and plug-like flow. Rates and processes of solifluction depend on climate, hydrology, geology and topography. Understanding and predicting the evolution of periglacial landforms related to solifluction requires quantitative relationships between the rate of solifluction and these variables. In this study data of vertical and horizontal solifluction rates and related ground temperature measurements at different depths from five study sites with stone-banked and turf-banked solifluction lobes in the Hohe Tauern Range are presented. The five sites are named Fallbichl-Schareck, Pasterze-Elisabethfelsen, Dösen-Seeschartl, and Hinteres Langtal (two sites on opposite slope aspects). The measurement periods at the sites cover four (2006-2010) to three years (2007-2010) of monitoring. Vertical solifluction rates were measured using flexible tubes and Rudberg columns which were placed annually down to depths of several decimetres and dig out in 2010 at the end of the monitoring period. Horizontal solifluction movement was measured annually using coloured straight lines sprayed (between two fixed points) on debris perpendicularly to the flow direction. Each year a new sprayed line was added and the shift to the previous year was measured with a tape. Finally ground temperature was continuously measured at each site at three different depths (between 0 and 75 cm) with 3-channel miniature temperature datalogger in order to understand the ground thermal regime and potential periods of liquid water during snow melt periods. Results from all sites are present and jointly discussed.