

## **Quantification and modelling of debris flows in the proglacial area of the Gepatschferner, Austria, using ground-based LiDAR**

**FLORIAN HAAS, TOBIAS HECKMANN, LUDWIG HILGER & MICHAEL BECHT**

*Catholic University of Eichstaett-Ingolstadt; Ostenstr. 18, 85072 Eichstaett, Austria*  
[florian.haas@ku.de](mailto:florian.haas@ku.de)

**Abstract** In August 2011, a large rainstorm event triggered several slope type debris flows on the steep Little Ice Age moraine deposits of the Gepatschferner. Since high resolution ground-based LiDAR data are available for before and after the event, erosion and accumulation of the single debris flows could be quantified very accurately. Besides the quantification of the sediment yield of this event, the DEM of difference calculated from the two LiDAR epochs allows for the identification and detailed mapping of process areas of the debris flows. Using the ground-based LiDAR DEM and the mapped starting zones of the event, the process areas of the debris flows were modelled using a 2-D friction model. The model was calibrated and validated by the detailed maps of the process areas. The paper presents the first results of both the quantification and the modelling of the slope type debris flows caused by the 2011 rainstorm event.

**Key words** debris flows; proglacial area; ground-based LiDAR; modelling; PROSA