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Rockfall Measurements in Alpine Catchments (Germany, Austria, Italy) by Terrestrial Laserscanning – First Results

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Up to now quantification of rockfall was done by indirect measurements on the rockfan, for example by nets. These methods were error-prone and did not consider for example different lithological conditions within the rock faces. So a direct differentiation between primary (weathering) and secondary rock fall (fluvial erosion) was not possible. Without this differen-tiation, an exact quantification of erosion by weathering on rock faces is not feasible.
In this study, a high resolution Terrestrial Laserscanner (Riegl LMS Z420i) in combination with a 3D-Software (RiscanPro) is used to quantify rock fall activity on rock faces by multitemporal measurements (twice a year). To define the runout distances of fallen rocks and the roughness of the surface, also the corresponding talus cones are scanned.

To account for different climatic and lithologic conditions, these measurements are carried out in three alpine catchments, which are situated in the northern (Höllental/ Garmisch Parten-kirchen, Germany), the central (Zwieselbachtal/ Ötztal, Austria) and the southern part (Val di Funes, Italy) of the alps.

Beside the quantification of rockfall activity and the spatial analysis of the talus cones, the measurements should help to validate and to improve existing rockfall models. With the high resolution spatiotemporal data, it should be possible to model the disposition for rockfall ac-tivity and so to differentiate active areas on a rock face from inactive areas (e.g. dependency between lithology and weathering). By identifying corresponding zones of detachment and deposition, it should be possible to improve existing process models which model runout dis-tances (e.g. dependency between surface roughness on the rock fans, friction parameters and runout distance of rocks)
The poster presentation shows first analyses and results of the DFG founded project which started in Fall 2007.