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Terrestrial LiDAR monitoring of rock slope-channel coupling

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In steep terrain, various types of landslides (e.g. rock falls, debris flows and slides) are important erosional processes which often have a major impact on fluvial systems. On the one hand, they may divert river channels to opposite slopes or even block entire river channels, leading to the formation of landslide-dammed lakes. On the other hand, rivers prepare or even trigger landslides by undercutting slopes, which again will have an impact on the river channel.
Our focus is on two study areas. One of them, the Schlichem Valley, is located in the Swabian Alb (SW-Germany), a lower mountain range consisting of Jurassic sedimentary rocks forming a cuesta landscape. There, the focus is on a larger landslide complex which blocked the river Schlichem three times during the 18th century and which is still active. Recent activity, especially at the location where the landslide enters the fluvial system, is investigated using Terrestrial LiDAR monitoring. The second study area is located in the Gesaeuse National Park in the Austrian Alps. There, various geomorphic environments are investigated by Terrestrial LiDAR including a vertical rock face in Dachstein limestone, which talus slope is directly coupled to the river Enns. The talus slope is built up by rock fall deposits, eroded mainly through smaller debris flow events. Furthermore, the talus slope is undercut by flood events of the river Enns.
In this study a concept and first results are presented. They suggest how rock slope processes and their interactions with river channels can be monitored.