

La monophotogrammétrie comme méthode de suivi de mouvements gravitaires : évaluation et cas d'étude.

Monophotogrammetry as gravity movements monitoring method: evaluation and study cases

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Photography has been used for many years as an important tool for landscape evolution monitoring through time. The use of images at different timescales is, for example, useful to understand a gravity movement and its evolution by capturing information about a situation at a certain time. Here we are considering a method of gravity slope movements called monophotogrammetry. This is a method based on pictures captured at different times. Regarding to the context of the object of interest, monitoring has also a practical aspect that should be considered. The lighter the material needed is, the more practical it is to monitor slope movements located in remote places. The low-cost aspect of a monitoring system based mostly on a camera, avoiding the use of an expensive laser scanner, is another interest of monophotogrammetry. Even if the major optical characteristics influencing this system are known, it still requires a quantifiable analyse of which of them are impacting the results. The first aim of this project is therefore to highlight and to quantify the impacts of optical characteristics on the monitoring results. Thus, the objective is to define for what types of slope movement dynamic the monophotogrammetric method can be considered as valuable. Comparing the results of this low-cost method to a precise reference, such as a LiDAR (Light detection and ranging), the project is based on double data acquisition of slope movement. Two different types of slope movements have been chosen: rockfalls and landslides. Field study cases are completed by multiple data acquisition indoors.



Figure 1: Field work illustrated by one slope movement near Sion, Valais. The two monitoring systems are used for comparison: acquisition by LiDAR and by camera.