



Cosmic Ray Exposure (CRE) method to constrain the dynamic of gravitational movements in the southern part of the Belledonne massif (French Alps)

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A better understanding of dynamic destabilization of landslides needs acquisition of chronological constraints. Cosmic ray exposure (CRE) has become a powerful method for dating the exposition of gravitational scarps. Our study is focused on the Belledonne External Crystalline Massif (French Alps) which was structured by the Hercynian and Alpine orogenesis. The southern part of the massif is carved by the east-west trending lower Romanche valley. A significant number of active or past large slope movements concentrated on a surface of less than 30 km² are observed along the Romanche valley in micaschist lithology. The most important one corresponds to the Séchilienne landslide which affects the right bank of the Romanche River. The active part of this movement has been considerably investigated since its reactivation in 1985 (geological survey, surface displacement measurements and sub-surface geophysical prospecting). No chronological constraints have however been acquired. The initialisation of the gravitational destabilization is supposed due to the ice melting during the last retreat of the würmian Romanche glacier i.e. 18,000 yr BP. In order to check this hypothesis, we have performed 3 vertical profiles sampling quartz-bearing veins along the main scarp, extending 30 meters high and several hundred meters long. The preliminary results confirm a post-würmian origin of the onset of the gravitational destabilization of the Séchilienne landslide. Moreover, the denudation kinematics of the scarp seems to be continuous from the beginning of the destabilization to the present

days.