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Mechanical parameters evolution of weathered granular gneissic products in trenches and escarpments nearby great landslides. The case of the La Clapière landslide, France.

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The comprehension of rheological parameters distribution is a fundamental step for landslides studies. Indeed, such parameters are well known in the case of shallow landslides thanks to geotechnical studies. However, these parameters are poorly known in the case of deep seated landslides (DSL) such as La Clapiere. The problem is the scaling change in the DSL case, and the choice of the most relevant material to characterize these landslides behaviour. Generally, three different approaches are used:

1. The rheological study of the more or less healthy rock.

2. The rheological study of the crushed rock in the shearing zone (for DSL).

3. The bibliographical study.

In our study case, we differently consider the notion of the rheological comportment at a large scale. Lots of large moving rock slopes are controlled and initiated by the tectonic history. The La Clapière landslide is a part of a very large moving rock slope. In this area, mains tectonic faults are clearly reactivated as gravitational faults, giving rise to trenches and escarpments. The La Clapière landslide shearing surface was initiated along a trench or an escarpment associated to a tectonic fault. Hence, the comportment of the large moving rock slope and the La Clapière landslide is a direct consequence of the regional tectonic history, and therefore, depends on the shear surface fault rheology. The surface product of these reactivated faults is a weathered granular gneissic material.

We are interested in the spatial evolution of the mechanical properties of this residual

material. The space distribution analysis was carried out through a great number of sampled materials (about 30/km^2). Considering the granular character of this material, we practised typical laboratory tests in soil mechanics (triaxial compression tests), generally used to study the great landslide shearing surface. This typical test allows us to study the mechanical parameters variability, clearly related to mechanical and physicochemical deterioration.

We examine the evolution of the effective frictional angle and the effective cohesion for a material sampled as a function of the distance from the La Clapière landslide. A possible correlation exists between rheology and distance but the interpretation of these results remains delicate.