



A new method for safety factor calculations applied to Gouetsoule landslide (Pyrenees, France)

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The study area is located in the Aspe Valley, more precisely near the Urdos city (Western Pyrenees, France). This valley is located in the axial zone of Pyrenees and is constituted of Palaeozoic formations. The studied landslide, with a 3.106 m³ volume, affects till formations deposited at the last glacial era (Wurm, Holocene, 8000 years ± 1000 years). The tills are mainly composed of Permian sandy blocks (95%) with some Carboniferous slaty fragments (5%). The thickness of this formation varies between 1 to 40 meters. This important variation is caused by the morphology of the subjacent substratum. This one is constituted of upper Carboniferous schists with the Culm facies (Namurian, -300My). This formation is a detritic serie of several hundred meters thickness interbeded with sandy banks (0,2 to 5 thickness meters) and pelites (1 to 9 thickness meters). In this study, 16 Gouetsoule till samples were collected for geotechnical analysis to estimate their mechanical properties and their variability. The aim of this study was to realise a precise modelling of the slope. The consideration of the spatial variability of mechanical parameters in stability calculations requires the use of a new analytical method. We propose to generate values of mechanical parameters with random fields theory. The variability of till mechanical properties follows a law which can be quantified by considering the till as a random field with a spatial structure. This new method allows to take into account the variability of the formation in the stability calculations of slope and to obtain an accurate estimation of the security factor (F).