



Slope stability assessment on the Algiers area (Algerian margin) using a geotechnical approach and a 3D slope stability model.

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The northern African margin is a seismically active region. During the last century, several important earthquakes occurred offshore Algeria. After the Boumerdes earthquake (May 2003), important studies have been concentrated on the submarine tectonic structures and the consequences of these events.

The present study represents the first slope stability analysis realized on the Algiers area. The main objective of this work was to characterize the mechanical properties of the sediments and to realize the present-day slope stability assessment.

Data for the study have been acquired during three oceanographic campaigns. The Maradja (“MARge Active DJazair”) campaign (August-September 2003), was aimed at identifying active faults and sedimentary instabilities offshore Algeria. Three giant cores have been also collected during the PRISMA campaign (May-June 2004). Coring operations and side-scan sonar high-resolution images have been conducted last November offshore Algiers (Maradja 2- 2005).

This work is based on the geotechnical laboratory tests (cyclic triaxial cell tests, oedometric tests, shear vane test) carried out on the sediment cores. We present here the core MD04-2799 (PRISMA-2004), located at 32 Km from the coastline and 2295 mbsf, just upslope a slump scar, characterizing the undisturbed sediments.

A detailed analysis has been realized based on the results from the core analysis combined with different available data set (swath bathymetry, very-high resolution profiles). In this work, a new three-dimensional slope stability analysis model has been used in order to assess the slope stability. We present the impact of the earthquakes

loading on the sediment behaviour, the expected geometry of the failure and the critical failure surface. Results from our model illustrate that the slope located near the MD04-2799 core could be affected by new slides.

New in-situ monitoring, CPT measurements data, cores and high-resolution seismic profiles will be acquired (cruise planned in 2007) for a better and more exhaustive characterization of the slope stability along the entire Algerian margin.