Geophysical Research Abstracts
Vol. 20, EGU2018-15997-3, 2018
EGU General Assembly 2018

Geomechanical characterization of volcanic materials of Azores and Madeira archipelago

Paulo Amaral (1), Ana Malheiro (1), Luís Teixeira (1), José Vieira de Sousa (2), Javier Jubera (3), Luis Hernández (3), Luis González de Vallejo (4,5), Sergio Leyva (7), Ana Miranda (4), Sónia Victória (6), and Alexandra Delgado (6)

(1) Laboratório Regional de Engenharia Civil (Açores), Ponta Delgada, Portugal (paulo.ap.amaral@azores.gov.pt), (2) Laboratório Regional de Engenharia Civil (Madeira), Funchal, Portugal , (3) Consejeria de Obras Públicas e Transportes, Canárias, Espanha, (4) Instituto Volcanológico de Canarias, Espanha, (5) Universidad Complutense de Madrid, Espanha, (7) Consejeria de Carreteras, Canárias, Espanha, (6) Universidade de Cabo Verde

A project called MACASTAB is being developed, by a group of technicians from the Canarias, Azores, Madeira and Cape Verde. This project aims to prepare a methodological guide for the natural risk management produced by the instability of volcanic slopes and talus in Macaronesia archipelagos. One of its tasks is to collect information on the physical and mechanical characteristics of the materials that constitute the mentioned islands.

On both Portuguese archipelagos, (Azores and Madeira) studies on rock proprieties (physical and mechanical) from a geotechnical point of view are very scarce and show different geomechanical proprieties and behaviours from materials with non-volcanic origin.

So, the main goal of this study is the geomechanical characterization of volcanic rocks present on both archipelago, in order to obtain a parameter range of values on different lithotypes.

Several physical and mechanical tests were performed to various lithotypes (e.g. moderately weathered to fresh basalts (s.l.), trachytics (s.l.), welded ignimbrites, and low density pyroclasts), namely uniaxial compression strength, point load tests, elastic modulus, wave propagation velocity, dry density, open porosity, among others. The results obtained in each archipelago are presented and the similar lithotypes are compared.
From the previous data, several interesting correlations were obtained, allowing estimating certain parameters used for easy and rapid tests (e.g. relationship between uniaxial compression strength, open porosity, wave propagation velocity with the dry density, and others).

Some considerations were made about the potential uses of these materials, as well as the problems related to rock fall processes and their application in civil engineering works.

This work is supported by MACASTAB project: Cooperation programme INTERREG MAC 2014-20.