

深地科学论坛（第二十六讲）：深地科学前沿 热点问题探究

时间：2022年4月6日 15:30-17:00

地点：腾讯会议直播（ID号：463 697 6477）

报告人	报告人单位	报告题目
Mahdia Hattab	Université de Lorraine (法国洛林大学)	On the Mechanical behaviour of clays in relation with the microstructure organization (黏土宏观力学行为与微观结构特征的关系)

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深部岩土力学与地下工程国家重点实验室

深部地下工程学科创新基地

《深地科学（英文）》

江苏岩土力学与工程学会

力学与土木工程学院

2022. 4. 2

报告人简介:



Mahdia Hattab is full Professor of civil engineering at the Université de Lorraine, she works in the field of soils mechanics and geotechnics. At the Université de Lorraine she teaches an undergraduate course of geotechnical engineering, and applications of finite elements to geotechnical structures, a graduate course of soil mechanics and, at doctoral level, a course in multiscale multiphysical behavior of clayey soils.

Mahdia Hattab research activities are mainly focused on experimental investigation of strain mechanisms in clayey materials. Strain mechanisms are considered from the microscopic/mesoscopic scale (groups of particles) to the macroscopic scale (specimen level). Her research includes multiscale approach of deformation mechanisms, effect of the structure and cementation on soft soils behavior, microcracks network development in soft clays and micromechanical

modeling of clayey material using physicochemical local properties. Mahdia Hattab serves as Director of Civil Engineering Master of the Université de Lorraine, and as Director of the GE@2M (Fédération de Recherche Grand Est Mécanique des Matériaux). She is member of the French University National Commission (CNU) from 2018. From Oct. 2017 to Oct. 2019 she served as Chair of the EMI « Granular Material Technical Committee of the ASCE. She chaired the first EMI International Conference organized in Europe (2016EMI International Conference).

报告摘要:

On the Mechanical behaviour of clays in relation with the microstructure organization

(黏土宏观力学行为与微观结构特征的关系)

In remoulded saturated reconstituted clay, macroscopic strain mechanisms are directly related to the applied stress tensor. At the microscopic scale, it is well known that structural anisotropy progressively develops with the loading, as shown for instance along oedometric loading (Delage and Lefebvre, 1984; Hammad et al. 2013) or axisymmetric triaxial loading (Wahyudi and Hicher, 2000; Hattab and Fleureau, 2010). However, few data exist linking micro mechanisms and macro mechanisms.

The aim of the presentation is 1) to attempt to explore, in remoulded clays, the induced structural anisotropy which occurs at the microstructural level, and then to try to relate it to the strain mechanisms at the macroscopic scale and 2) to analyse the influence of the mineralogy on the behaviour of clays, through test results performed on mix-clay soils. The latter were made from different clays, the kaolin and the montmorillonite, by varying their fraction in the mixture. Microstructure variations were examined using SEM image processing technique, allowing to identify the orientation of the particles and to relate with the mechanical loading and the corresponding pore properties.