



海岸和近海工程国家重点实验室  
STATE KEY LABORATORY OF COASTAL AND OFFSHORE ENGINEERING

# 海岸和近海工程国家重点实验室 学术讲堂

题目： Hydro-mechanical modelling of gap-graded soils considering suffusion

报告人： 尹振宇 教授

时间： 2022年06月17日 15:30-16:30

地点： 腾讯会议房间号： 966 2798 6502



## 内容简介：

尹振宇，香港理工大学土木与环境工程系教授。1997年获浙江大学建筑工程专业学士学位，之后在浙江嘉华建筑设计有限公司工作5年，于2003年、2006年分别获得法国岩土工程专业硕士和博士学位。主要研究方向有：土体宏微观特性及本构关系；岩土工程模型试验及大变形数值分析；人工智能在岩土工程中的应用。曾于2011年入选上海市特聘教授“东方学者”；兼任美国土木工程师协会（ASCE）“粒状材料专业委员会”理事；欧洲环境与土木学报(EJECE)、Geotechnique Letters副主编；日本土工（S & F）、加拿大土工（Can. Geot. J.）、ASCE-IJOM、Acta Geotechnica、Transportation Geotechnics、Computers and Geotechnics等期刊编委；在国际核心刊物上发表SCI论文230余篇，WOS的H指数为47。

摘要： This study attempts to formulate a coupled numerical model in the framework of continuum mechanics in order to investigate the phenomenon of suffusion and its consequences on the mechanical behaviour of soils. For this purpose, a four-constituent numerical approach has been developed to describe the suffusion process. The detachment and transport of the fine particles have been described by a mass exchange formulation between the solid and fluid phases. The stress-strain relationship of the soil is represented by a non-linear incremental model. Based on experimental data, this constitutive model has been enhanced by the introduction of a fines content dependent critical state, which allows accounting for the influence of fines on soil deformation and strength. The applicability of the numerical approach to capture the main features of the suffusion process and its impact on the mechanical behaviour of the eroded soil has been validated by comparing numerical and experimental results of suffusion tests on HK-CDG mixtures, which demonstrated that the model was able to reproduce with good accuracy the experimental data. Furthermore, the influence of the stress state, the initial soil density, and the initial fraction of fines have been analysed through numerical simulations.

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<http://slcoe.dlut.edu.cn>  
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联系人： 乔东生 [qiaods@dlut.edu.cn](mailto:qiaods@dlut.edu.cn)