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Tuesday 13 October 2020 12.00 BST (13.00 CET)

SANISAND-F: A FABRIC-BASED SAND CONSTITUTIVE FRAME-WORK WITHIN ANISOTROPIC CRITICAL STATE THEORY

Dr Alexandros Petalas, Imperial College London

ABSTRACT

The effect of fabric anisotropy on the mechanical behaviour of granular geomaterials is widely recognized. Literature reports large differences on the undrained strength and deformation characteristics of sands, when samples with similar initial fabric (same sample preparation method) are subjected to different loading conditions in terms of principal stress direction. This effect is also observed when loading with the same principal stress direction is applied to samples that are prepared with different methods. Traditional frameworks of sand constitutive modelling do not account for the effect of fabric anisotropy, that may lead to significant inaccuracies when modelling boundary value problems in geotechnics. In this talk, Alexandros will discuss the development of a fabric-based sand constitutive model, namely the SANISAND-F, that simulates the effect of inherent and evolving anisotropy. The model is formulated within the anisotropic critical state and bounding surface plasticity theories. Emphasis will be given on the formulation, calibration, and validation of the model, while current limitations will also be discussed.

SPEAKER BIO

Alexandros Petalas is currently a Research Associate (Postdoc) in the department of Civil and Environmental Engineering of Imperial College London. He received his MSc from TU Delft (Netherlands) in 2012, and then he joined the research team of Plaxis BV. On 2013 he started his doctoral studies at UC Davis (USA) and he received his PhD in 2018. Prior to his appointment at Imperial College he was a postdoctoral researcher at Chalmers University of Technology (Sweden). His research interests lie in the areas of constitutive and numerical modelling of geomaterials, soil-atmosphere interaction modelling and coupled phenomena in geotechnics.

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