



OBAVIJEST O PREDAVANJU

Hrvatsko geotehničko društvo, u suradnji s Geotehničkim fakultetom i Rudarsko-geološko-naftnim fakultetom organizira predavanje
koje će na RGNF-u, Pierottijeva 6, 26.04.2019. godine (petak), s početkom u 12:00 sati, u predavaoni VP02 (prizemlje), održati

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Dr. Erich Bauer is professor at the Institute of Applied Mechanics (IAM) at Graz University of Technology in Austria. He did his post-graduate studies at the University of Karlsruhe in Germany under the supervision of Prof. G. Gudehus and Prof. D. Kolymbas and holds a habilitation in Mechanics. Before joining the IAM, he worked in a consulting company on research projects in Europe and USA using the New Austrian Tunnelling Method (NATM). Prof. Bauer is a regular reviewer of papers for various international journals, a PhD thesis examiner, a keynote speaker at a large number of international conferences, and member of different editorial boards. His scientific work focuses on the mechanical properties of granular materials and their constitutive modelling, using classical and higher order continuum descriptions. His main areas of research are continuum mechanics, experimental investigations and the constitutive modelling of engineering materials including the long-term behaviour of granular soils, rockfills and mechanically treated waste materials. His scientific results have been published in 146 papers and books and presented in more than 130 oral presentations, including invited plenary lectures at congresses, symposia, workshops and seminars. Prof. Erich Bauer is the project leader of a number of national and international scientific technical co-operations with universities in Europe and Asia. He is also visiting professor at Hohai University in China. Prof. Bauer is the founder of the international conference series on Long-term Behaviour of Dams (LTBD).

Title: Constitutive Modelling of Grain Fragmentation Using a Micro-polar Approach

Keywords: Granular Materials, Solid Hardness, Grain Fragmentation, Micro-polar Hypoplasticity

Abstract: Grain fragmentation in the form of grain damage at contact areas, grain abrasion and grain crushing mainly depends on the morphology of the granular material, the strength of the solid grains and the loading path. Triaxial compression tests and ring shear tests show that grain fragmentation becomes dominant within the localised zone as a result of resistance of grains against rotation and shearing. Under large shearing grain abrasion is related to the amount of grain rotation and it can already occur under lower pressures. Thus micro-polar effects may play an important role when shear strain localization takes place and grain fragmentation is not only related to the pressure level. Recently a conceptual model for the description of grain fragmentation was developed, which takes into account the influence of pressure and micro-polar effects on the change of the grain size. In particular, the change of the grain size distribution is reflected in a simplified manner using an evolution equation for the reduction of the mean grain diameter. In this context it is assumed that a decrease of the mean grain diameter is influenced by an increase of the mean stress, the norm of the rate of the curvature and the norm of the difference of the rate of the micro- and macro-rotations. The change of the grain size is also accompanied by a reduction of the limit void ratios and the critical void ratio. Another key parameter of the proposed model is the so-called solid hardness, which is defined based on a continuum description proposed by Bauer. In particular, the solid hardness is related to the grain assembly under isotropic compression and does not mean the hardness of a single grain. This conceptual model was integrated into a micro-polar hypoplastic description. To demonstrate the performance of the extended micro-polar model numerical results of various boundary value problems are also discussed.

Prijave: putem internet stranica HGD-a do srijede 24.04. do 12:00 sati.