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Titolo	Micro to MACRO Mathematical Modelling in Soil Mechanics [[electronic resource] /] / edited by Pasquale Giovine, Paolo Maria Mariano, Giuseppe Mortara
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Disciplina	624.15136015118
Soggetti	Mathematical physics Mathematical models Mechanics Mechanics, Applied Mathematical Applications in the Physical Sciences Mathematical Modeling and Industrial Mathematics Classical Mechanics Theoretical and Applied Mechanics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Stiffness of destructured weak carbonate rock -- A nonlinear hyperelastic anisotropic model for soils -- Mapping grain strains in sand under load using neutron diffraction scanning -- Dual porosity-single permeability poromechanics response of an inclined wellbore with no-flow outer bound-ary -- Numerical scattering experiments on assemblies of fine-grained particles -- Granular jamming as controllable stiffness mechanism for medical devices -- Adhesion failures in granular mixtures -- Evolution of granular contact gain, loss and movement under shear studied using synchrotron X-ray microtomography -- Microstructural changes underlying the macro-response of a stiff clay -- Micromechanical insights of strain rate effect on crushable granular materials -- Compressibility and swelling of an overconsolidated highly plastic Paleogene clay -- DEM analysis of jacked open-ended pile -- A microscale-inspired chemo-mechanical

model for artificially and naturally bonded soils -- Geochemical control of laponite dispersions for pore fluid engineering of granular soils -- Adsorption and diffusion of pollutants in unsaturated soils -- Modelling water flow and ion transport in clay soils: the case of KCl wells in the head of an earthflow -- Micromechanics of granular media characterised using X-ray tomography and 3DXRD -- Aging effects on liquefaction resistance and shear wave velocity in reconstituted sand -- Coupled fluid-particle modeling of submerged granular collapse -- The paradox of the aspect ratio and its effect on bulk stress of a granular assembly -- The coefficient of lateral earth pressure K_0 subjected to freezing and thawing for granular soils -- Photoelastic observation of loading and crushing of a single grain -- Effect of rubber inclusion on the friction angle at critical state for different host sands -- Does G_0 of granular materials carry information on their particle characteristics? -- Heterogeneity and variability of clay rock microstructure in a hydro-mechanical double scale FEMFEM analysis -- Strains inside shear bands observed in tests on model retaining wall in active state -- Storage and loss moduli in an ideal aggregate of elastic disks, water saturated -- Particle shape distribution effects on the triaxial response of sands: a DEM study -- A conceptual framework for particle crushing: from the strength of the particle to the evolution of the granular distribution -- The effects of strain localization on the determination of Critical State seen with experimental and numerical models -- An experimental study on the tangential contact behavior of soil interfaces -- Experiments show a second length scale in weakly cohered granular materials -- Influence of elasto-plastic, cohesive contacts on the bulk stiffness of dense polydisperse packings -- A study of greenfield tunnelling in sands using FEM, DEM, and centrifuge modelling -- Discrete element modeling of crushable tube-shaped particles -- Theoretical modelling of the state-dependent behaviour of granular soils based on fractional derivatives -- Modelling wave propagation in dry granular materials -- An investigation of the fracture surface from 3D fragment reassembly -- Effects of dilation and contraction on immersed granular column collapse -- Effects of particle 3D shape on packing density, critical state, static instability and liquefaction of sands using a proposed relative state parameter -- Particle migration and clogging in radial flow - a microfluidics study.

Sommario/riassunto

This special issue collects selected contributions (excluding general lectures) to a Symposium on "Micro to MACRO Mathematical Modelling in Soil Mechanics", which took place at the University of Reggio Calabria, Italy, from May 29th to June 1st, 2018. The Symposium provided an opportunity to enhance the scientific debate on the construction of mathematical models for the description of the physical behaviour of soils, as well as on the suggestions provided by the micro-mechanical observation of the matter. The focus was on the comparison between the appropriateness of models and the need of mathematics to obtain rigorous results, which involves know-how from applied mathematical physics, geotechnical engineering and mechanics of solids. The contributions were selected by the Editors and the other Members of the Scientific Committee of the Symposium: Gianfranco Capriz (Pisa, Roma), Claudio di Prisco (Milan), Wolfgang Ehlers (Stuttgart), James T. Jenkins (Cornell), Stefan Luding (Twente), David Muir Wood (Dundee), Kenichi Soga (Berkeley).
