CALL FOR PAPERS

JOURNAL OF GEOMECHANICS AND GEOPHYSICS FOR GEO-ENERGY AND GEO-RESOURCES

Special issue: Contributions of micro-mechanics to geo-energy and geo-resources

With the increasing need of carbon foot-print reduction and understanding climate change effects, researchers are more and more challenged to investigate the behaviour of natural materials through the length scale. This approach allows developing performance based design methods which limit risks and costs, especially in the areas of engineering grand challenges involving geo-hazard, i.e. petroleum engineering and energy geotechnics. Over the past four decades, advances in micro-scale testing and numerical methods have been providing a better understanding of the macro-mechanical behaviour of soils and rocks. In this context, contact behaviour of geo-materials assumed between pairs of grains, rock blocks and cemented particles plays an important role in the development of realistic numerical simulations particularly if Discrete Element Methods (DEM) are adopted. Also X-ray CT scanning, high-speed imaging and microscopy techniques have proved useful in investigating the factors responsible of soil/rock behaviour subjected to thermo-chemo-mechanical loads.

This Special Issue calls for papers in various areas of micro-mechanics related to geotechnical and geological engineering with emphasis on applications to geo-energy utilization, mining and petroleum engineering applications. The focus will be directed on (i) advances in measurement of geo-material surface characteristics and their evolution during grain-grain and block-block types of contacts, (ii) analytical and numerical methods related to micro-mechanics,(iii) image and microscopy analysis and (iv) the link between response at the micro-scale and geo-energy and geo-resources applications. Potential topics involving the role of micro-mechanics on these applications include but are not limited to the following list:

Areas of interest

- Contact mechanics and frictional characteristics of geo-materials
- Experimental micromechanics and new measurement techniques for soils and rocks
- Grain breakage and statistical methods of analysis
- Discrete element method DEM and coupled DEM-FEM studies related to geo-energy and geo-resources
- Constitutive modelling and analytical methods related to contact mechanics, grain damage, impact mechanics
- Fracture mechanics
- Advances in image and microscopy analysis from nano to micro scale for geo-materials
- Structure/fabric evolution of soils/rocks and applications to geo-energy and geo-resources
- Micromechanics contributions, experimentation and numerical simulations of cemented soils
- Micromechanics contributions related to sandstone reservoirs, gas hydrate and geothermal fields
- Micromechanics contributions related to mining and petroleum engineering and oil/gas technologies
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Time lines

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Paper publication: ~ July 2018

Interested authors are encouraged to contact the corresponding Guest Editor for further information and advice.