IMPERIAL COLLEGE GEOTECHNICS SEMINAR

THURSDAY, 20TH JULY, 4:15PM, ROOM 307

GEOMECHANICAL AND NUMERICAL MODELING OF GAS HYDRATE BEARING SEDIMENTS by Dr. Marcelo Sánchez

Gas hydrates soils are generally found in sub-marine sediments and in permafrost regions. Gas hydrates represents an attractive source of energy, it is estimated that significant methane reserves are in the form of hydrates. Methane hydrate deposits can lead to large-scale submarine slope failures, blowouts, platform foundation failures, and borehole instability. Hydrate formation, dissociation and methane production from hydrate bearing sediments are coupled Thermo-Hydro-Chemical and Mechanical (THCM) processes that involve, amongst others, exothermic formation and endothermic dissociation of hydrate and ice phases, mixed fluid flow and large changes in fluid pressure. The behavior of Hydrate Bearing Sediments (HBS) is very complex and the geomechanical modeling poses great challenges. A comprehensive THCM approach for HBS is briefly presented in this lecture. Special attention is paid to the geomechanical behavior of HBS. The application of the proposed models to different cases involving laboratory and field investigations has been very satisfactory. The model managed to capture very well the main features of HBS behavior and they also assisted to interpret the behavior of this type of sediment under different loading and hydrate saturation conditions.

BIOGRAPHY

Dr. Marcelo Sánchez was appointed as Associated Professor in the Zachry Department of Civil Engineering, Texas A&M University, in September 2009 (promotion to Professor effective September 2017). He obtained his first degree in Civil Engineering from the Universidad Nacional de San Juan (Argentina). His Master and Ph.D. (2004) degrees are from the Universidad Politecnica de Catalunya (UPC, Barcelona, Spain). His expertise lies in the area of advanced geomechanics, considering complex problems involving thermal, hydraulic, mechanical and geo-chemical (THMG) couplings. His research interests also cover the study of the behavior of unsaturated soils and expansive clays. The main areas of applications are: 'Energy Geotechnics', 'Geo-environmental Engineering', 'Foundations' and 'Transportation Geotechnics'. He has published more than 100 peer review papers. He is acting as an Associated Editor for five international journals. Among other awards, in 2012 he received, along with his co-authors, the "George Stephenson Medal" from the Institution of Civil Engineers in the United Kingdom. He is the founder and current Chairman of the ISSMGE (Int. Society for Soil Mechanics and Geotechnical Eng.) Technical Committee TC308 on "Energy Geotechnics".

Marcelo Sánchez, Ph.D.
Associate Professor
Zachry Department of Civil Engineering
Texas A&M University
3136 TAMU | College Station, TX 77843-3136
Tel. (+1) 979 862 6604 | Fax: (+1) 979 862 7696
Email address: msanchez@civil.tamu.edu
https://ceprofs.civil.tamu.edu/msanchez/index.html