

Post-Doctoral position at GeoRessources Laboratory, University of Lorraine, France

Discrete modeling of deformation and failure processes in transversely isotropic rocks

A Post-doctoral opportunity is available at GeoRessources laboratory, University of Lorraine, France, in the field of Geomechanics. Applications are invited for a 12 months contract to work on the development of original numerical approaches for the study of failure processes in transversely isotropic rocks.

The role

The aim of this specific research project is to investigate the deformation and failure processes taking place around underground structures in transversely isotropic rocks. More particularly, the work will consist in (i) enhancing a numerical model based on the discrete element method (DEM) to better describe the behavior of transversely isotropic rocks and (ii) developing representative three dimensional simulations of the engineering problem (underground openings under various confined conditions). The model's predictions will be compared to both laboratory scale experiments and in situ observations. The final goal is to better predict how excavation damage zones (EDZ) develop around underground openings in anisotropic media. Numerous applications to civil engineering, nuclear waste disposal, deep geological storage or even petroleum engineering problems are clearly targeted.

The applicant

Applicants should have a PhD in Geomechanics, Civil Engineering or Computational Mechanics. Backgrounds in Numerical Modeling and Programming is mandatory, experience with DEM modeling techniques beneficial. The successful applicant will demonstrate a strong commitment to academic research in the proposed field. He/she will have excellent written and oral communication skills.

Research environment

The PhD will be supervised by Dr L. Scholtès, Assistant Professor at the Ecole Nationale Supérieure de Géologie in Nancy. The applicant will join the Multi-scale Hydro-GeoMechanics (HGM) group at GeoRessources Laboratory, a research center under supervision of both the CNRS and the University of Lorraine in Nancy, France. The HGM group comprises 8 academics and 10 postgraduate researchers. It is an emergent and pro-active group in the fields of Geomechanics and Transfer in Porous Media. The applicant will be part of a project involving ANDRA, the french national radioactive waste management repository agency.

The opportunity

It is a 12 months full-time position financed to the amount of approximately €25,000/year. The position is available from January 2016.

Application

Applications should be sent by email to Luc Scholtès (luc.scholtes@univ-lorraine.fr). They should include a detailed resume and a cover letter with suggestion for referees. In their cover letter, applicants are invited to include a short statement (200 words) explaining how they understand the issues related to fracture processes in transversely isotropic rock and their implications at the scale of an engineering structure.

Online info:

HGM: <http://georessources.univ-lorraine.fr/content/hydrogeomecanique-multi-echelles-0>

GeoRessources: <http://georessources.univ-lorraine.fr/>

University of Lorraine: <http://www.univ-lorraine.fr/>

CNRS: <http://www.cnrs.fr/>

ANDRA: <http://www.andra.fr/>