LOSS OF UNIQUINESS IN POROMECHANICAL MODEL WITH ENHANCED MEDIA

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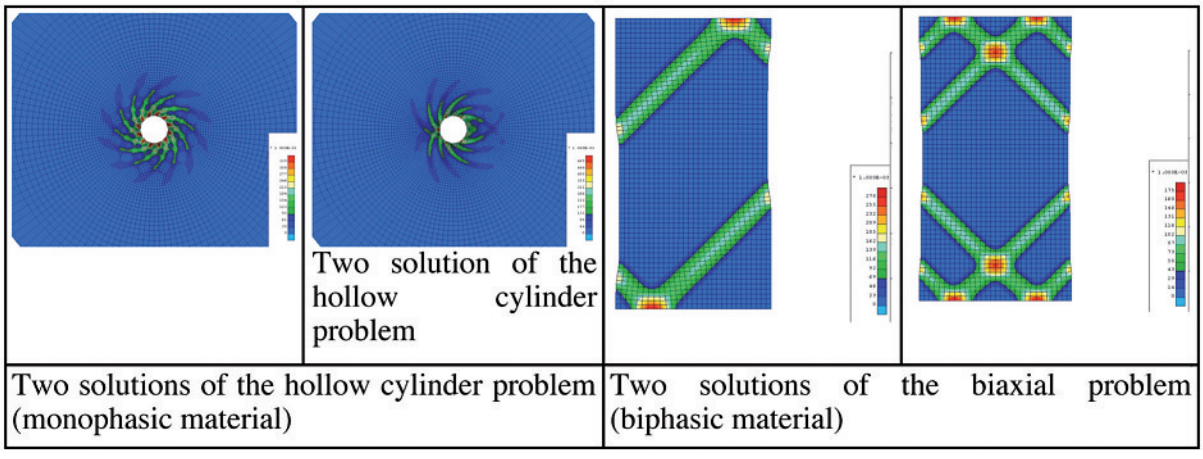
These paper deals with the problem of uniqueness in simulation the behavior of geomaterials with enhanced media to controlled the widths of bands. In the last 10 years, the loss of uniquiness has been clearly demonstrated in some initial boundary value problems involving constitutive equations modeling the degradation of the strength of materials. First in theoretical aspect with a simple test for a one dimensional problem of traction in a bar where the analytical solutions can be developed [1]. In this article, It was also demonstrated that it is possible to retrieve all the analytical solutions in numerical simulations, only by using different starting guesses in the Newton's method.

Then thanks to some classical numerical and experimental tests in geomecanical the non uniquiness is proved : the biaxial [2] test and the borehole problem [3]. However in alls theses study, the geomaterial is assumed to be monophasic. That's why is relevant to investigated the problem of uniquiness in taken into account the fluid part in the media [4]. We deals in the framework of poromechanical model where the mechanical part is obeying a second gradient theory (not local) to ensure a regularization of the localisation pattern [5]. This work is realized within the framework of the European Project TIMODAZ (Thermal Impact on the Damaged Zone Around a Radioactive Waste Disposal in Clay Host Rocks, http://www.timodaz.eu/). As one benchmark in this project [6], the classical mechanical part is a Drücker-Prager model with a softening in the cohesion and a hardening in the frictional angle. It's an non-associed plasticity model for limited dilatancy. The parameters of this model are the same of this benchmark to simulated the Boom Clay material. Finally this paper demonstrates that several numerical solutions could be obtained as monophasic for the biaxial test modelling.



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