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Numerical solution of a linear elasticity equation in a saturated porous media in presence of fluid flow

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SUMMARY

The flow within a porous object at the submillimeter scale, that is to say at the scale of its pores, is an essential link in the study of transfers within natural geological structures or artificial porous materials.
The overall work is therefore to study the flow of a fluid passing through a rock, or a porous media more generally, as well as to study the impact of the forces exerted on the solid by the fluid, which changes the shape of the solid and therefore the flow.
Thus, one of the important points to achieve this objective is to determine the deformation of the porous medium. To do this, we will numerically solve the linear elasticity equation which governs the deformation of the porous medium using the finite element method coupled to a Darcy-Brinkmann-Stokes equation [1] for the fluid.

Keywords: porous media, linear elasticity equation, finite element method

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References

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