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Linkage between extended poroelasticity and micromechanics

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We attempt to formalise the relationship between the poroelasticity theory and the effective medium theory of micromechanics. Assumptions of these approaches vary, but both can be directly linked by considering the undrained response of a material. To analyse the linkage between poroelasticity and micromechanics, we do not limit ourselves to the original theory of Biot. Instead, we propose a concise extension of anisotropic poroelasticity, where pore fluid pressure may vary within the representative volume element. As a consequence, the inhomogeneities are not necessarily interconnected—they may form separated pore sets that are described by distinct poroelastic parameters and pore pressure. Further, we attempt to incorporate the effective methods inside Biot-like theory and investigate the poroelastic response of various microstructures. We show the cases where such implementation is valid and the others that appear to be questionable.

Participation

In-Person

References

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