



## **The Biot Coefficient for a Low Permeability Heterogeneous Limestone**

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Experimental and theoretical developments are used to estimate the Biot coefficient for the heterogeneous low permeability Cobourg limestone. The coefficient is important to the Biot poroelastic model used to examine coupled hydro-mechanical and thermo-hydro-mechanical processes. The constraints imposed by both the heterogeneous fabric and low intact permeability [ $K_{int}$ ] (10-23, 10<sup>-20</sup> m<sup>2</sup>) requires the development of alternative approaches to estimate the Biot coefficient. Large specimen (150 mm diameter, 300 mm length) bench-scale triaxial tests to accommodate the heterogeneous fabric are complemented by results for the volume fraction based on the mineralogical compositions derived from XRD measurements. The compressibility of the solid phase is based on theoretical developments proposed for multi-phasic elastic materials. The analytical estimates for the Biot coefficient for the Cobourg limestone are compared with results for other limestones reported in the literature.