

Poroelectric plate model obtained by simultaneous homogenization and dimension reduction

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In this talk, the starting point of our analysis is coupled system of elasticity and weakly compressible fluid. We consider two small parameters: the thickness h of the thin plate and the pore scale ε_h which depend on h . We will focus specifically on the case when the pore size is small relative to the thickness of the plate. The main goal here is derive a model for a poroelectric plate from the $3D$ problem as h goes to zero using simultaneous homogenization and dimension reduction techniques. The obtained model generalizes the poroelectric plate model derived in “A. Marcianiak-Czochra, A. Mikelić, A rigorous derivation of the equations for the clamped Biot-Kirchhoff-Love poroelectric plate, Arch. Rational Mech. Anal. 215 (2015), 1035-1062” by dimension reduction techniques from $3D$ Biot’s equations.

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