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On the integral representation formula for various effective parameters of poroelastic materials.

In a series of papers published in the 50s and 60s, M. A. Biot laid down the foundation of the theory of acoustic properties of poroelastic materials. In the past two decades, Biot's theory has been rigorously verified and generalized by various authors using the theory of homogenization. In these papers, all the effective parameters in Biot's theory are represented by solutions to auxiliary problems which are related to the microstructure and the physical properties of the constituents. We derived from these results the **integral representation formulas** for various effective properties of poroelastic composites and poro-viscoelastic composites together with their connection with acoustic inverse-homogenization problems. (Received February 07, 2006)