Outline: Dispersion in Poroelastic Systems

August 11, 2000

I. Introduction

A. What is velocity dispersion and why is it important?

B. Some references on this and related topics.

II. Gassmann's Equations

Presenting a simple derivation of Gassmann's well-known results for the bulk and shear moduli of a liquid saturated poroelastic system.

Continuing

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III. Effective Medium Theory

A. Presenting a low-frequency result from effective medium theory, the CPA, for the same porous liquid-filled elastic system as before.

B. Also, showing how Gassmann's result can be compared to other effective medium results using the "canonical functions of elasticity."

IV. The Dichotomy

Why is it that two very well-understood theories, both of which are certainly low-frequency theories, give clearly different results for the constants?

Continuing

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V. Resolution of the Dichotomy

Showing how to build up results like those predicted by effective medium theory starting from Gassmann's analysis of the problem.

VI. Conclusions