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departure in the description  
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mechanics that studies the  
interaction between fluid  
flow and solids deformation  
within a linear porous  
medium and it is an  
extension of elasticity and  
porous medium flow

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(diffusion equation). The deformation of the medium influences the flow of the fluid and vice versa.

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is that in poroelastic media there exist three types of elastic waves: a shear or transverse wave, and two types of longitudinal or compressional waves, which Biot called type I and type II waves. The transverse and



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type I (or fast)

longitudinal wave are  
similar to the transverse  
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consisting of an elastic  
matrix containing  
interconnected fluid-  
saturated pores. In physical  
terms the theory postulates  
that when a porous material  
is subjected to stress, the

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resulting matrix deformation leads to volumetric changes in the pores. This book is devoted to the analysis of fluid-saturated poroelastic beams, columns and plates made of materials for which diffusion in the

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longitudinal direction(s) is  
viable, while in the  
perpendicular direction(s)  
the flow can be considered  
negligible because of the  
micro-geometry of the solid  
skeletal material. Many  
microstructures and

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smart structures. If this is  
so, it would be interesting  
that such structural  
elements could work as both  
sensors and actuators, e.g.  
the fluid can "feel" the  
change of the temperature by  
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