

On the Volumetric Growth of Binary Solid-Fluid Mixtures

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This work aims at investigating the possibility of modelling the volumetric growth of a binary solid-fluid mixture within the context of biomechanical perspectives in rational mixture theories. A solid-fluid mixture may be regarded as a couple of body manifolds, embedded into the three-dimensional Euclidean space, so as to share a smooth region of the physical environment while undertaking independent motions (see e.g. Atkin and Craine (1976), Bowen (1976), Rajagopal and Tao (1995), Truesdell (1957)). Extending the pioneering proposal put forward by Rodriguez, Hoger and McCulloch (1994) to binary solid-fluid mixtures, the bulk growth of a soft tissue is regarded as the time evolution of its stress-free configuration (Di Carlo and Quiligotti (2003), Epstein and Maugin (2000)), described by a smooth (but geometrically noncompatible) tensor field on the reference configuration.

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