



MECHANICAL ENGINEERING SEMINAR

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Reorientation of cell layers under stretch as an active orthotropic material

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In this talk I will present a continuum model to describe the reorientation of an anisotropic material structure, characterized by two fiber families able to modify their orientations following different evolution dynamics. The evolution equations are derived in a thermodynamically consistent way, and passive and active contributions to the reorientation process are identified. It is shown that a weaker extension of a well-known coaxiality result holds. The transversely isotropic and orthotropic cases are then recovered by imposing the proper constraint on the fiber rotation. Applications to biological experiments on cell layers under stretch are discussed, showing a good agreement between the model and the experimental results. Even though the focus is on cell layers, the framework remains general and may be employed to describe reorientation in engineering materials.