
A Numerical Stability Study for Homogenized Constraint Mixture Models

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Abstract

This study focuses on the numerical stability of homogenized constrained mixture models. The models incorporate the multi-constituent nature of heart tissue, allowing for the prediction of mechanical behavior under ongoing Growth&Remodeling. During G&R, especially when there are significant pressure changes – like in hypertension - one can observe numerical instabilities that do not reflect actual physiological changes. The research investigates stabilization techniques that can enhance the computational stability without compromising the accuracy of the simulations. The findings provide insights into the balance between computational demands and the physiological accuracy required to model heart tissue mechanics effectively.

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