

MUSCLE MODELING

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A third project is the numerical modeling of muscles, where the most challenging aspect remains the definition of the constitutive model. We have performed a literature survey of finite element modeling of muscles, where we conclude that the state of the art is at a rather low level. The muscles typically being modeled are skeletal muscles in passive stretching using Hill's model from before WWII. Large deformation theory is being invoked. There is room for much improvement of these continuum models, e.g., modeling of self-contact and of attachment sites. In the figures we show the typical muscle sarcomere element and Hill's constitutive model of it, being modeled together with the corresponding zero-dimensional constitutive model. Here CE is a nonlinear (velocity-dependent damper).

