An Inverse Problem for the Cardiac Myocyte (Heart Muscle Cell) Vibration Model

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**Abstract**

This paper investigates methods for solving the inverse problem for the internal passive force of cardiac myocyte vibration model. An inverse problem is formulated that relies on displacement measurements for the estimation of unknown quantities appearing in the source term (internal passive force). Using experimental data for the source term the forward model results are given. However, due to uncertainty in this input data there is a need for inverse problems. For the inverse problem, two different methods are used: least squares with Tikhonov regularisation and Quantum-Behaved Particle Swarm Optimisation (QPSO). For each, a functional form is assumed for the source term in determining the parameters. The efficiency and performance of these two methods are compared.