

NUMERICAL SCHEMES FOR ORDINARY DIFFERENTIAL EQUATIONS DESCRIBING SHRINKING AND STRETCHING MOTION OF ELASTIC MATERIALS

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Abstract. In this paper, we discuss shrinking and stretching motion of elastic materials by a mathematical model given as a system of ordinary differential equations. First, we propose the model in which the stress is given by a function having a singularity. By using the singularity we can obtain a uniform estimate for the strain from below. Due to the estimates, we establish existence and uniqueness of solutions to the model. Moreover, we construct a numerical scheme preserving the energy, and show existence and convergence of numerical solutions.

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