

OPTIMAL SHAPES OF CRACKS IN A VISCOELASTIC BODY

V. V. Shcherbakov, O. I. Krivirov'ko

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We consider an optimal control problem for equations describing the quasistatic deformation of a linear viscoelastic body. There is a crack in the body, and displacements of opposite faces of the crack are constrained by the nonpenetration condition. The continuous dependence of the solution to the equilibrium problem on the shape of the crack is established. In particular, we prove the existence of a shape for which the crack opening is minimal.

Keywords: viscoelasticity, crack, nonpenetration condition, optimal control, fictitious domain method.

V. V. Shcherbakov Cand. Phys.-Math. Sci., Lavrentyev Institute of Hydrodynamics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, 630090 Russia; Novosibirsk State University, Novosibirsk, 630090 Russia, e-mail: sherbakov87@gmail.com.

O. I. Krivirov'ko Institute of Computational Mathematics and Mathematical Geophysics of the Siberian Branch of the RAS, Novosibirsk, 630090 Russia, e-mail: krivorotko.olya@mail.ru.

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