

NUMERICAL SIMULATION OF THE ELASTIC BODY PROBLEM WITH CRACKS ON THE NON-PENETRATION CONDITIONS

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We consider the elastic body problems with one or periodically located small cracks. Non-penetration conditions are given on the edges of these cracks. The nonlinear elastic body problem is formulated as a variational inequality. We use penalty method and the finite-element method to calculate numerically its approximate solution. Convergence of solutions is proved for elastic body with one crack. Also we consider small deformations of an elastic body with periodically located cracks. Numerical simulations of such problem is studied providing the linear dimension of the period of crack placement tends to zero. Using homogenization we investigate the problem on the periodicity cell, where one crack is located.