The Method of Fundamental Solutions in Three-dimensional Elastostatic Problems

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The paper deals with the application of the method of fundamental solutions (MFS) to solving three-dimensional problems of elastostatics. Classical approach in MFS leads to algebraic linear equations system with unknown intensities of fundamental solutions. Some functional attitude is proposed in order to minimize the errors of the method. A functional is introduced in order to minimize the values of the sought source coefficients. This attitude makes possible that the number of source points can be bigger than the number of collocation points. It has been observed that the values of errors were smaller than in the case of simple collocation method. Calculations were carried out for both the Dirichlet boundary conditions and Neumann conditions. The influence of parameters such as the numbers of the collocation and source points, the distance between source points and the boundary of the domain, on values of errors and condition number was examined.

Keywords: Method of Fundamental Solutions, elastostatics, source and collocation points.