

THE METHOD OF PROBABILISTIC SOLUTION FOR 3D DIRICHLET ORDINARY AND GENERALIZED HARMONIC PROBLEMS IN FINITE DOMAINS BOUNDED WITH ONE SURFACE

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Abstract

The Dirichlet ordinary and generalized harmonic problems for some 3D finite domains are considered. The term "generalized" indicates that a boundary function has a finite number of first kind discontinuity curves. An algorithm of numerical solution by the method of probabilistic solution (MPS) is given, which in its turn is based on a computer simulation of the Wiener process. Since, in the case of 3D generalized problems there are none exact test problems, therefore, for such problems, the way of testing of our method is suggested. For examine and to illustrate the effectiveness and simplicity of the proposed method five numerical examples are considered on finding the electric field. In the role of domains are taken ellipsoidal, spherical and cylindrical domains and both the potential and strength of the field are calculated. Numerical results are presented.