

To the efficiency of a Green's function modification of the method of functional equations

Yuri A. Melnikov

Department of Mathematical Sciences, Middle Tennessee State University
Murfreesboro, TN 37132, USA

ymelniko@mtsu.edu

A Green's function modification is proposed for the so-called method of fundamental solutions. The modification targets boundary-value problems stated in regions of irregular configuration for second order applied PDEs of elliptic type with discontinuous coefficients. Problems of this type arise in the analysis of potential fields in compound bodies.

We challenge the established title of the *method of fundamental solutions* proposing to call it the *method of functional equations*, instead. The motive is that the concept *fundamental solution* does not make the title uniquely distinguishable. At the same time, it would be unfair to call in question some role of this concept in the method, which is, however, indecisive, contrary to the *boundary integral equation method*, for example. A different feature makes, in our opinion, the method uniquely recognizable, supporting our version of the title. Analysis of the computational potential of a Green's function modification of this method is presented.

Keywords: equations with discontinuous coefficients, Green's function method.