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ANALYSIS OF DIRECT BOUNDARY-DOMAIN INTEGRAL EQUATIONS FOR A MIXED BVP WITH VARIABLE COEFFICIENT, II: SOLUTION REGULARITY AND ASYMPTOTICS

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ABSTRACT. Mapping and invertibility properties of some parametrix-based surface and volume potentials are studied in Bessel-potential and Besov spaces. These results are then applied to derive regularity and asymptotics of the solution to a system of boundary-domain integral equations associated with a mixed BVP for a variable-coefficient PDE, in a vicinity of the curve of change of the boundary condition type.

1. Introduction. This paper is the second part of the paper [**6**], where we analyzed four versions of Boundary-Domain Integral Equation Systems (BDIES) to which a mixed (Dirichlet-Neumann) boundary value problem for the heat transfer equation with a variable heat conductivity coefficient can be reduced, and gave a full description of existence, uniqueness, and operator invertibility in appropriate Sobolev spaces.

In the present paper, we first discuss properties of surface and volume potentials, constituting the BDIES, in the Bessel potential spaces H^s_p and in the Besov spaces. Then we use these properties to analyze regularity and asymptotic behavior of the BDIES solutions.

A motivation for analysis of boundary-domain integral equations and notations used can be found in [**6**]. To simplify references, we will precede numbers of sections, equations and statements from [**6**] by I.

Keywords and phrases. Partial differential equation, variable coefficients, mixed problem, parametrix, pseudo-differential equations, boundary-domain integral equations, asymptotics.

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