

On transmutation operators in the theory of boundary value problems

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Abstract: This report is devoted to Fredholm properties of the equation

$$(Au)(x) = v(x), \quad x \in M,$$

where M is a manifold with a non-smooth boundary, A is a pseudo-differential operator with the symbol $\tilde{A}(x, \xi)$, the right hand side $v(x)$ and the unknown function $u(x)$ belong to appropriate Sobolev–Slobodetskii spaces.

We suggest some constructions to develop the theory of boundary value problems on manifolds with a non-smooth boundaries. We discuss basic principles for such a theory and describe main results that we have obtained to this time. Further, we show how these results are related to the theory of boundary value problems on non-smooth manifolds.

Special operators, so-called transmutation operators play an important role in these considerations. Some of them were described in our papers [1,2]. We can extend the class of such operators.

Keywords: elliptic pseudo-differential equation; wave factorization; general solution; boundary value problem

2010 Mathematics Subject Classification: 35S15, 47G30

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