

# METHOD OF REFINEMENT BY HIGHER ORDER DIFFERENCES FOR ELLIPTIC EQUATIONS WITH BITSADZE - SAMARSKII TYPE NONLOCAL BOUNDARY CONDITIONS

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In the present work we consider the Bitsadze--Samarskii type nonlocal boundary value problem for a second order elliptic equation on a rectangle. The solution of a difference scheme of second-order accuracy is taken for the first approximation. Using this solution, the right-hand side of the difference scheme is corrected. By the methodology [1] of obtaining consistent estimates it is shown that the solution of the corrected scheme converges at the rate  $O(h^m)$  in the discrete  $L_2(\omega)$ -norm, when the exact solution belongs to the Sobolev space  $W_2^m(\Omega)$ ,  $m \in [2, 4]$ .

Results, analogous to those given in the present work, are obtained in [2] for the Dirichlet problem posed for an elliptic equation, and also in [3] for the third boundary value problem of elasticity theory.

**Acknowledgment.** This work was supported by Shota Rustaveli National Science Foundation (Grant FR/406/5-106/12).

## References

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