

INVESTIGATION OF ORIGIN OF BOUNDARY LAYER
ON A PROBLEM FOR A FIRST ORDER ORDINARY LINEAR
PERTURBED DIFFERENTIAL EQUATION UNDER GENERAL
NON-LOCAL BOUNDARY CONDITION

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Abstract. The investigation of the forming of the boundary layer is usually carried out by Euler scheme. The limit value is calculated for the obtained solution by tending small quantity to zero. If this value does not satisfy to the boundary conditions the boundary layer is formed in this point.

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Key words. Boundary layer, general non-local boundary condition, perturbed differential equation, Euler scheme.

REFERENCES

- [1] DUOLAN, E.P., MILLER, J.J.H. and SCHILDERS, L.H.A., *Uniform numerical methods for problems with initial boundary layers*, Boole Press Dublin, 1980.
- [2] VLADIMIROV, V.S., *Equations of mathematical physics*, Nauka, Moscow, 1976 (in Russian) [English transl of 2nd Russian ed. Marcel Dekker New York (1971)].
- [3] ALIEV N. and JAHANSHAH, M., *Sufficient conditions for reduction of BVP including a mixed PDE with non-local boundary conditions to Fredholm integral equations*, Int. J. Math. Educ. Sci. Tech., **28** (3) (1997), 419–425.

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