

# Qualitative properties of the solution of elliptic non-divergent equations of second order with Zaremba-type boundary conditions in non-smooth boundary

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**ABSTRACT.** In the talk I will present results obtained recently with Professor Nazarov from St. Petersburg Department of Steklov Mathematical Institute of Russian Academy of Sciences. We will study the behavior of the solution of elliptic equations in non-divergent form near a boundary point which is the junction of the Dirichlet and Neumann (with oblique derivatives) boundary data. The first result for regularity of the point of junction of Dirichlet and Neumann boundary was obtained for equations in divergent form by professor Mazya. His technique is not applicable for equations in non-divergent form. In our case the Neumann boundary is assumed to be only Lipchitz or with a specific "funnel" type structure. Under this assumption the problem cannot be reduced to a Dirichlet problem and it requires a particular barrier technique. We use the concept of Landis-type Lemma of Growth to prove a Wiener-type test for regularity of the point of junction of Dirichlet and Neumann boundaries. Regularity condition is formulated in term of Wiener type series with s-capacity depending on Dirichlet boundary only.