

About solutions properties of Tricomi problem for Gellerstedt equation

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Abstract: Tricomi problem research has a fundamental importance for all theory of mixed type equations and various areas of application. This problem for Tricomi equation $y u_{xx} + u_{yy} = f(x, y)$ was originally suggested in [1]. Later more common Gellerstedt equation $(sgny) y^m u_{xx} + u_{yy} = f(x, y)$ was suggested in [2].

We consider the Tricomi problem for the Gellerstedt equation for the case in which the elliptic part of the boundary is the curve

$$\sigma_\delta = \left\{ (x, y) : \left(x - \frac{1}{2} \right)^2 + \left(\frac{2}{m+2} y^{\frac{m+2}{2}} + \delta \right)^2 = \frac{1}{4} + \delta^2, -\infty < \delta < +\infty \right\}.$$

Smooth solutions for this domain have been got in [3]. The notion of an n -regular solution for model Lavrent'ev-Bitsadze equation has been introduced in [4]. In present work we prove a criterion for the existence of n -regular solution of Tricomi problem for Gellerstedt equation.

Keywords: Tricomi problem, Gellerstedt equation, non continuous solutions

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