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Application 1

УДК 517.55

On some conditions for the existence of a holomorphic continuation of functions in a ball

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Introduction

Consider the n-dimensional complex space $\mathbb{C}^n$, $n > 1$ of variables $z = (z_1, \ldots, z_n)$, $z_j = x_j + ix_{n+j}$, where x_j are real numbers, $j = 1, \ldots, n$. We introduce the module of the vector $|z| = \sqrt{|z_1|^2 + \ldots + |z_n|^2}$ and the differential forms $dz = dz_1 \wedge \ldots \wedge dz_n$ and $d\bar{z} = d\bar{z}_1 \wedge \ldots \wedge d\bar{z}_n$, and also $dz[k] = dz_1 \wedge \ldots \wedge dz_{k-1} \wedge dz_{k+1} \wedge \ldots \wedge dz_n$. The topology in $\mathbb{C}^n$ is defined by the metric $|z - w|$.

We denote the Sobolev space, $s \in \mathbb{N}$, as $\mathcal{W}_2^s(B)$. Recall that this space consists of functions $f \in \mathcal{L}^2(B)$ for which all derivatives $\partial^\alpha f$ up to the order of s belong to $\mathcal{L}^2(B)$, where

$$\partial^\alpha f = \frac{\partial^{\|\alpha\|} f}{\partial z_1^{\alpha_1} \cdots \partial z_n^{\alpha_n} \partial \bar{z}_1^{\alpha_{n+1}} \cdots \partial \bar{z}_n^{\alpha_{2n}}},$$

and $\alpha = (\alpha_1, \ldots, \alpha_{2n})$, $\|\alpha\| = \alpha_1 + \ldots, \alpha_{2n}$.

Application 2

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