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HÖLDER ESTIMATES FOR LOCAL SOLUTIONS FOR $\bar{\partial}$ ON A CLASS OF NONPSEUDOCONVEX DOMAINS

LOP-HING HO

ABSTRACT. We prove in this paper that in a class of nonpseudoconvex domains we have the anticipated Hölder estimate for the local solution of the $\bar{\partial}$-equation. We then extend the class of domains where the theorem applies. It is also noted that the method can be applied to improve a theorem by Range and Diederich-Fornaess-Wiegerinck.

Introduction. We investigate in this paper the Hölder estimates for the local solutions of the $\bar{\partial}$-equation on domains of the form $\Omega = \{r(z) < 0 : r(z) = \sum_1^p |z_i|^{2m_i} + g(z_{p+1}, \dots, z_n)$, where g is C^∞ with $g(0) = 0$ and $dg(0) \neq 0\}$. Thus the domains we consider here are not necessarily pseudoconvex. We prove that the *right* Hölder estimate holds in a neighborhood of 0 for $(0, q)$ forms with $q \geq n - p$.

It is well known that for strictly pseudoconvex domains the (1/2) Hölder estimate holds. (See, for example, Grauert and Lieb [**6**], Henkin [**7**] and Kerzman [**10**].) In the weakly pseudoconvex domains there are the works of Range [**11**], Diederich-Fornaess-Wiegerinck [**3**] and Bruna and Castillo [**1**] on ellipsoid type domains. Recently, Fefferman and Kohn [**4**] and Range [**13**] proved the estimate in $\mathbf{C}^2$ on domains of finite type by using different methods.

In the case that the domain is not necessarily pseudoconvex Fischer and Lieb [**5**] proved the (1/2) Hölder estimate on q-convex domains with smooth boundary. Recently Schmalz [**14**] proved the same result on domains with nonsmooth boundary.

In this paper we study the problem on a certain class of nonpseudoconvex domains. In this class of domains the nonnegative directions of the Levi-form is of ellipsoid type as in Range [**11**] while in the other directions it is arbitrary. We prove (Main theorem) that the anticipated order of Hölder estimate holds in a neighborhood of the origin. This type of phenomenon is known in subelliptic estimates of

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