BULLETIN (New Series) OF THE
AMERICAN MATHEMATICAL SOCIETY
Volume 7, Number 1, July 1982

SMOOTH EXTENDABILITY OF PROPER HOLOMORPHIC MAPPINGS

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In [9] Ch. Fefferman proved that any biholomorphic mapping $f: \Omega_1 \longrightarrow \Omega_2$ between strictly pseudoconvex C^∞-smooth domains in $\mathbf{C}^n$ extends smoothly to the boundary. Subsequently, the proof of this result has been simplified considerably by S. Webster [14, 15], E. Ligocka [12], St. Bell [1, 2]. And it was St. Bell who realized the importance of the following regularity condition of the Bergman projection for the proof of such extendability results:

DEFINITION. A domain $\Omega \subset\subset \mathbf{C}^n$ is said to satisfy condition R for its Bergman projection operator P if for any positive integer s there is an integer N such that P is a bounded linear operator from $W_0^{s+N}(\Omega)$ to $H^s(\Omega)$.

(Here $W_0^s(\Omega)$ denotes as usual the closure of $C_0^\infty(\Omega)$ in the Sobolev s-Norm $\|\cdot\|_s$ with respect to the volume Lebesgue-measure on Ω and $H^s(\Omega)$ is the space of holomorphic functions on Ω with finite $\|\cdot\|_s$-norm.)

Since condition R is a consequence of subelliptic estimates for the $\bar{\partial}$-Neumann problem, it is known to be satisfied for instance in the following cases:

(1) Ω strictly pseudoconvex, C^∞-smooth (J. J. Kohn [10]);

(2) Ω pseudoconvex, C^ω-smooth (J. J. Kohn [11], K. Diederich, J. E. Fornaess [6]).

The new methods allowed to generalize Fefferman's result. It is now known that a biholomorphic mapping $f: \Omega_1 \longrightarrow \Omega_2$ extends smoothly up to the boundary if Ω_1 and Ω_2 are C^∞-smooth and, in addition, both satisfy condition R [1] or both are pseudoconvex and at least one satisfies condition R [2].

The result which we wish to announce deals with the case of proper holomorphic mappings and is contained in the

THEOREM. *Let $\Omega_1, \Omega_2 \subset\subset \mathbf{C}^n$ be C^∞-smooth pseudoconvex domains and suppose that Ω_1 satisfies condition R. Then any proper holomorphic mapping $f: \Omega_1 \longrightarrow \Omega_2$ extends smoothly up to the boundary.*

For unbranched mappings f this result is contained in K. Diederich and J. E. Fornaess [7]. This also includes the case of Ω_1, Ω_2 being strictly pseudoconvex and f proper holomorphic since any such f is necessarily unbranched, S. Pincuk [13]. Under different, more restrictive assumptions on Ω_1 and Ω_2 the result

Received by the editors January 6, 1982.
1980 *Mathematics Subject Classification.* Primary 32H99, 32F15.

0273-0979/82/0000-0296/$02.25