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HOLOMORPHIC MAPPINGS INTO TIGHT MANIFOLDS

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This paper gives an extension (*Proposition* 3) of *Theorem* C of H. Wu's paper [4], as well as a few other results. The terminology will be that of [4].

If M and N are complex manifolds $A(M, N)$ will denote the set of holomorphic mappings between M and N. It is a topological space under the topology of uniform convergence on compact subsets of M. If f_i is a sequence in $A(M, N)$ and g is in $A(M, N)$ then $f_i \to g$ will mean that the f_i's converge to g in this topology. A pair (N, d), where N is a complex manifold and d is a distance on N, will be called *tight* iff $A(M, N)$ is equicontinuous with respect to d for all complex manifolds M. In fact (N, d) is tight iff $A(B^n, N)$ is equicontinuous with respect to d, where B^n here denotes the unit ball in C^n. For details see *Part* I of [4].

Our basic lemma, interesting for its own sake, is

PROPOSITION 1. *Let M be a connected complex manifold, U an open subset of M, and (N, d) be tight. For $f \in A(M, N)$ define $i_U(f) \in A(U, N)$ to be the restriction of f to U. Then i_U is a homeomorphism of $A(M, N)$ into $A(U, N)$.*

PROOF. i_U is one-to-one because U is open in M. If $f_i \to g$ in $A(M, N)$ it is clear that $i_U(f_i) \to i_U(g)$. Thus i_U is continuous, and it remains only to show that $i_U(f_i) \to i_U(g)$ in $A(U, N)$ implies that $f_i \to g$ in $A(M, N)$.

Suppose $i_U(f_i) \to i_U(g)$ in $A(U, N)$. Let $\mathfrak{U} = \{V \subset M\colon V \text{ open in } M \text{ and } i_V(f_i) \to i_V(g) \text{ in } A(V, N)\}$. Partially order $\mathfrak{U}$ by inclusion. If $V_1 \subset V_2 \subset V_3 \subset \cdots$ is a totally ordered chain in $\mathfrak{U}$, it is clear that $V = \bigcup V_j$ is a member of $\mathfrak{U}$. Since $U \in \mathfrak{U}$, $\mathfrak{U}$ is not empty, so Zorn's Lemma implies that $\mathfrak{U}$ contains maximal elements. Let U_0 be one such. We will show that $U_0 = M$.

If not, $\partial U_0 = \overline{U}_0 - U_0$ is not empty. Let $x \in \partial U_0$ and $\epsilon > 0$. Since N