PACIFIC JOURNAL OF MATHEMATICS
Vol. 78, No. 2, 1978

COMPLEX BASES OF CERTAIN SEMI-PROPER HOLOMORPHIC MAPS

TOSHIO UDA

The existence theorem of complex bases of quasi-proper holomorphic maps was studied by N. Kuhlmann. In this paper the existence of the complex bases in a more general case will be shown.

0. Introduction. In the function theory of several complex variables, the complex bases of holomorphic maps of analytic spaces have been introduced as a generalized concept of Riemann surfaces defined by inverse functions of given holomorphic functions of one complex variable.

Let $f: X \to Y$ be a holomorphic map of analytic spaces. How does f have a complex base? Authors have discussed the sufficient conditions which allow for the existence of a complex base of f (cf. for example, [3], [5], [6], [7]). If f is proper, then f has a complex base ([7]). N. Kuhlmann [3] showed existence theorems in the case of quasi-proper (N-quasi-proper). f is called *quasi-proper* (resp. *N-quasi-proper*) if, for every compact subset K of Y, there exists a compact subset $\tilde{K}$ of X such that each of the irreducible branches (resp. each of the connected components) of fibres on K intersects $\tilde{K}$.

On this subject, an attempt will be made to abate the condition, so that each of the given unions of connected components of fibres intersects $\tilde{K}$. For such holomorphic maps, we shall have an existence theorem of complex bases (of type of N. Kuhlmann's).

THEOREM. *Let X be an irreducible normal analytic space, f: $X \to Y$ be a holomorphic map of X into an analytic space Y and E_f be the set of degeneracy of f. Suppose that f satisfies (C) and that $f(E_f)$ is analytic in Y. Then f has a complex base $(\tilde{Z}, \tilde{\varphi})$ and $\tilde{Z}$ is also normal. Moreover, the natural holomorphic map $\tilde{\psi}$ with $f = \tilde{\psi} \circ \tilde{\varphi}$ is proper and light, and $\tilde{\varphi}$ satisfies (C_1).*

1. Preliminaries. We assume in this paper that all analytic spaces are reduced and have countable bases of open sets.

Let $f: X \to Y$ and $f_1: X \to Y_1$ be holomorphic maps of analytic spaces. f_1 is said to *strictly depend* on f, if f_1 is constant on each connected component of fibres of f. f_1 is said to be *analytically related* to f, if f and f_1 strictly depend on each other. A pair (Z, φ) is called a *complex base* of f, if Z is an analytic space, and