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HOLOMORPHIC MAPPING INTO ALGEBRAIC VARIETIES OF GENERAL TYPE

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§ 1. Introduction

We will study holomorphic mappings

$$f\colon M \longrightarrow N$$

from a connected complex manifold M of dimension m to a projective algebraic manifold N of dimension n. Assume first that N is of general type, i.e.

$$\overline{\lim_{k\to\infty}} \frac{\dim H^0(N, K_N^k)}{k^n} > 0\,,$$

where $K_N \to N$ is the canonical bundle of N. If K_N is positive, then N is of general type.

In 1971, Kodaira [6] obtained that

THEOREM A. *Any holomorphic mapping $f\colon C^m \to N$ has every-where rank less than n.*

P. Griffiths & J. King [2], [3] furthermore proved that

THEOREM B. *If M is a smooth affine algebraic variety, then any holomorphic mapping $f\colon M \to N$ whose image contains an open set is necessarily rational.*

In 1977, W. Stoll [6] extended Theorems A, B to parabolic manifolds M. To state it, we let M possess a parabolic exhaustion τ and denote

$$(1) \qquad \nu = dd^c\tau\,, \qquad \sigma = d^c \log \tau \wedge (dd^c \log \tau)^{m-1}\,.$$

For a form φ of bidegree (1, 1) on M, write

$$(2) \qquad A(t, \varphi) = t^{2-2m}\int_{M[t]} \varphi \wedge \nu^{m-1}\,, \qquad T(r, s; \varphi) = \int_s^r \frac{A(t, \varphi)}{t}\, dt$$

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