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Mappings into compact complex manifolds with negative first Chern class

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§ 1. Introduction

The purpose of this paper is to prove the following[1]

THEOREM. *Let V be an n-dimensional compact complex manifold with negative first Chern class. Let* $\mathscr{D}=\{(z^1,\cdots,z^n)\in \boldsymbol{C}^n;\ |z^1|<1,\cdots,|z^n|<1\}$ *and* $\mathscr{D}^*=\{(z^1,\cdots,z^n)\in\mathscr{D};\ z^1\neq 0\}$. *If a holomorphic mapping* $f:\mathscr{D}^*\to V$ *is non-degenerate at some point, then f is a meromorphic mapping from $\mathscr{D}$ into V.*

COROLLARY 1. *Let V be as above. Let M be an n-dimensional complex manifold and A an analytic subvariety of M. If a holomorphic mapping f of $M-A$ into V is non-degenerate at some point, then f is a meromorphic mapping from M into V.*

COROLLARY 2. *Let V be as above. Let A be an analytic subvariety of V. Then every holomorphic transformation of $V-A$ extends to a holomorphic transformation of V.*

By a theorem of Kodaira, the assumption that the first Chern class of V be negative is equivalent to the condition that the canonical line bundle K_V is ample, i.e., the line bundle K_V^m, for some positive integer m, has sufficiently many holomorphic sections to induce an imbedding of V into a complex projective space. If this holds already for $m=1$, i.e., K_V itself has sufficiently many sections to induce an imbedding of V into a projective space, then K_V is said to be very ample. Under the assumption that K_V is very ample, the theorem above has been proved by Griffiths [1].

§ 2. The punctured disk D^*

The upper half-plane

$$H=\{w=u+iv\in \boldsymbol{C};\ v>0\}$$

is a universal covering space of the punctured disk

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1) For a generalization, see the Addendum to this paper.