



Several Complex Variables

Author: Hui Sun

Date: August 24, 2023

Contents

1 Lecture 1

2

We will start now.

Chapter 1 Lecture 1

We start with the goal. Let M be a compact complex manifold. And we consider $(L, h) \rightarrow M$, positive hermitian line bundle. **Remark** The positive is used in studying subharmonicity

Holomorphic sections of powers of L , note there is no holomorphic functions on the compact manifolds except for constants, hence we consider Holomorphic sections of powers of L , denoted by $H^0(M, L^{\otimes k})$

we note that $H^0(M, L^{\otimes k})$ is a hilbert space, and $S_0^k, \dots, S_{d_k}^k$ is a basis of H^0 . Bergman of f^n , we have

$$B_k(z) = \sum_{j=0}^{d_k} |S_j^k(z)|_h^2 \quad (1.1)$$

Main result, we have

$$B_k(z) = z_0 k^n + a_1 k^{n-1} + \dots$$

If we define a function from the manifold to the projective space, $\phi_k = M \rightarrow \mathbb{C}P^{d_k}$, we will introduce Kodaira's embedding, if $k \gg 1$, then ϕ_k is an embedding.