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MEROMORPHIC MAPPINGS

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INTRODUCTION

We study meromorphic mappings of complex spaces. The notion of meromorphic mapping we use was introduced by Remmert [9], [11][1]. Some part of the material dealt with in these lectures is contained in [15] and we shall therefore not give proofs for all statements.

The first sections are preliminary. The concept of correspondence is discussed and used to define meromorphic mappings (these are not mappings in the usual sense). Extension problems are studied in Section 4. Essential use is made of the extension theorem for analytic sets first proved by Thullen [21] in a special case and later generalized by Remmert and Stein [13]. The final section deals with maximal meromorphic mappings.

1. CORRESPONDENCES

Let X and Y be sets. A *correspondence*, denoted $f : X \underset{k}{\to} Y$, assigns to each $x \in X$ a subset $f(x) \subset Y$, which may be empty. $f : X \underset{k}{\to} Y$ is called empty if $f(x) = \varnothing$ for all $x \in X$. For $A \subset X$ we set $f(A) = \bigcup_{x \in A} f(x)$. A mapping $\varphi : X \to Y$ is looked upon as a special correspondence (we do not distinguish between a set consisting of one element and the element).

Each correspondence $f : X \underset{k}{\to} Y$ can be characterized by its *graph* $G_f = \{ (x, y) \mid x \in X, y \in f(x) \} \subset X \times Y$. The projection maps of G_f into X and Y are denoted by $\check{f} : G_f \to X$ and $\hat{f} : G_f \to Y$. Then, we have $f(x) = \hat{f}\left(\check{f}^{-1}(x)\right)$. If $f : X \underset{k}{\to} Y$, $f' : X \underset{k}{\to} Y$ are correspondences, we say that f is contained in f' if $G_f \subset G_{f'}$. For a subset $A \subset X$ we define the *restriction*

1) Another notion of meromorphic mapping and related concepts were defined by W. Stoll [16], [17].