A GENERAL FIRST MAIN THEOREM OF VALUE DISTRIBUTION. II

BY

WILHELM STOLL

University of Notre Dame, Notre Dame, Indiana, U.S,A. (1)

Dedicated to Marilyn Stoll

§ 3. The Levine form

Let V be a complex vector space of dimension $n+1$ with $n \in \mathbf{N}$. Suppose that a Hermitian product $(\,|\,)$ is given on V. On each $V[p]$, an associated Hermitian product $(\,|\,)$ is induced such that for every orthonormal base $\mathfrak{a} = (\mathfrak{a}_0, \ldots, \mathfrak{a}_p)$ the set

$$\{\mathfrak{a}_{\varphi(1)} \wedge \ldots \wedge \mathfrak{a}_{\varphi(p)} \,|\, \varphi \in \mathfrak{T}(p, n+1)\}$$

defines an orthonormal base of $V[p]$. If $0 \neq \mathfrak{x} \in V[p+1]$ and $0 \neq \mathfrak{y} \in V[q+1]$ with $p+q \leqslant n-1$, then the *projective distance* from $\mathfrak{x}$ to $\mathfrak{y}$ is defined by

$$\|\mathfrak{x}:\mathfrak{y}\| = \frac{|\mathfrak{x} \wedge \mathfrak{y}|}{|\mathfrak{x}|\;|\mathfrak{y}|}.$$

If $\xi \in \mathbf{P}(V[p+1])$ and $v \in \mathbf{P}(V[q+1])$, then the projective distance from ξ to v is well-defined by

$$\|\xi:v\| = \|\mathfrak{x}:\mathfrak{y}\| \quad \text{if} \quad \varrho(\mathfrak{x}) = \xi \text{ and } \varrho(\mathfrak{y}) = v,$$

where ϱ are the respective projections. Especially, this projective distance is defined as a real analytic function on $\mathfrak{G}^p(V) \times \mathfrak{G}^q(V)$ with

$$0 \leqslant \|\xi:v\| \leqslant 1 \text{ if } (\xi, v) \in \mathfrak{G}^p(V) \times \mathfrak{G}^q(V).$$

In the following, the vector space V, $V[p+1]$, $V[p+2]$ and $\mathbf{C}^r$ with $n-p=r$ will be considered. The natural projections are denoted by

---

(1) This research was partially supported by the National Science Foundation under grant NSF GP-3988.