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ON THE PROPAGATION OF DEPENDENCES

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An alternative proof of recent uniqueness theorems by Shanyu Ji is given. Ji's results are extended to the propagation of certain dependences from analytic subsets to the total space. Also these results are lifted from $\mathbb{C}^m$ to ramified covering spaces of $\mathbb{C}^m$. The first and second main theorems of value distribution are the essential tools in the proof.

Introduction. Let M be a connected, complex manifold of dimension m. Let $\pi: M \to \mathbb{C}^m$ be a proper, surjective, holomorphic map. Let $A_1, \ldots, A_q$ be pure $(m-1)$-dimensional analytic subsets of M with $\dim(A_i \cap A_j) \leq m-2$ whenever $i \neq j$. Define $A = A_1 \cap \cdots \cap A_q$. Let $E_1, \ldots, E_q$ be hyperplanes in general position in the projective space $\mathbb{P}_n$ with $n+1 < q$. Let p and k be integers with $2 \leq p \leq k \leq n+1$. For each $\lambda = 1, \ldots, k$ let $f_\lambda: M \to \mathbb{P}_n$ be a linearly nondegenerated meromorphic map. Assume that at least one of these maps f_λ grows quicker than the branching divisor of π. Assume that at least one of these maps f_λ has transcendental growth. For each $j = 1, \ldots, q$ assume that $f_\lambda^{-1}(E_j) = A_j$ does not depend on $\lambda = 1, \ldots, k$. Assume that for each collection of integers $1 \leq \lambda_1 < \lambda_2 < \cdots < \lambda_p \leq k$ the restricted maps $f_{\lambda_1}|A, \ldots, f_{\lambda_p}|A$ are not in general position. If

$$kn < (k-p+1)(q-n-1) \tag{0.1}$$

then $f_1, \ldots, f_k$ are not in general position (Theorem 4.2). This extends Theorem B of Shanyu Ji **[J1]** to parabolic covering spaces. He considers the case $M = \mathbb{C}^m, p = 2, k = 3$ and $q = 3n+1$ only. He concludes that f_1, f_2, f_3 satisfy a certain Property (P), which is perhaps a bit stronger but rather incomprehensible. Either condition implies algebraic dependence.

If each map $f_\lambda: M \to \mathbb{P}_n$ has rank n, condition (0.1) can be replaced by

$$k < (k-p+1)(q-n-1) \tag{0.2}$$

and we obtain the generalization of Ji's Theorem A (Theorem 6.2). Also Ji's Theorem C is extended (Theorem 6.1). Ji uses a special differential operator on $\mathbb{C}^m$ while we use the First Main Theorem for