ON THE COMMON ZEROES OF FINITE BLASCHKE PRODUCTS

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In [1] it has been shown that if K is any non-empty closed subset of the complex plane without any interior, and $P_1, P_2, \cdots, P_n$ are polynomials with complex coefficients such that any complex linear combination of P_i's has a zero in K, then P_i's must have a common zero in K. In this short note we prove a similar result for finite Blaschke products on the unit disc U of the complex plane. More precisely, if $\mathcal{B}$ is a finite dimensional vector space of analytic functions on U consisting of a basis of finite Blaschke products, and K is a non-empty closed set in $U - \{0\}$ with empty interior such that each element of $\mathcal{B}$ has a zero in K, then there exists a z_0 in K such that $g(z_0) = 0$ for every g in $\mathcal{B}$. Refer to [2], for results on Blaschke products.

Theorem. Let $\{k_i\}_{i=1,2,\cdots,n}$ be a sequence of positive integers and, $\{l_i\}_{i=1,2,\cdots,n}$ be sequences of non-negative integers. Let K be a