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ON AN ADDITIVE DECOMPOSITION OF FUNCTIONS OF SEVERAL COMPLEX VARIABLES

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1. **Introduction.** Recent attempts (see [1] and the references in the same article) to extend the Wiener-Hopf technique for functions of a single complex variable to those of two or more complex variables have relied on a remark of Bochner's [2] that guarantees the required decomposition under suitable restrictions. Bochner's remark states that: *if* $f(z_1, \cdots, z_n)$, $z_j = x_j + iy_j$, *is analytic in a tube* T: $\gamma_i < x_i < \delta_i$, $y_i \in (-\infty, \infty)$, *and if* $\int_{-\infty}^{\infty} \cdots \int |f(z_1, \cdots, z_n)|^2 dy_1 \cdots dy_n$ *converges in* T, *then there exists in* T *a decomposition* $f = \sum_{i=1}^{2^n} f_i$, *where each* f_i *is analytic and bounded in an octant shaped tube* T_i *containing the interior of* T. *Moreover, such a decomposition is unique up to additive constants.* The uniqueness of the decomposition is not verified in [2] but reference is made to H. Bohr's [3] corresponding result for functions of a single complex variable.

It is here shown that the uniqueness statement is false. However, the adjunction of the additional hypothesis that the $f_i \to 0$ when any one of the $x_j \to \infty$, in the tubes T_i, restores the uniqueness of the decomposition and justifies the use of the result in [2].

2. **A counter-example.** In the decomposition $f = \sum_{i=1}^{2^n} f_i$, f_1 is analytic and bounded in the tube T_1: $x_i > \gamma_i$, $y_i \in (-\infty, \infty)$, $i = 1, 2, \cdots, n$, and f_2 is analytic and bounded in the tube T_2: $x_1 < \delta_1$, $x_j > \gamma_j$,