POSITIVE DEFINITE SEQUENCES WITH CONSTANT MODULUS

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ABSTRACT. Let $a_0, a_1, ..., a_N$ be complex numbers. We consider the Toeplitz matrix T_N, where the (i,j)-th component is a_{i-j} if $i \geq j$ and $\overline{a_{j-i}}$ if $i < j$. If T_N is positive and $|a_0| = |a_1| \neq 0$, then $a_2, a_3, ..., a_N$ can be represented in terms of a_0 and a_1 and there exists a unique positive definite sequence f such that $f(i) = a_i$ for any $i = 0, 1, 2, ..., N$. In particular, it holds $|f(n)| = |a_0|$ for any n. We also provides some applications related to this fact.