E. I. Olefir (Odessa, Ukraine)

LINEAR-FRACTIONAL TRANSFORMATIONs OF INNER MATRIX-VALUED FUNCTIONs AND THEIR APPLICATION

Let θ be an inner in upper halfplane $\mathbb{C}_+$ matrix-valued function of order $n \geq 1$. Then the matrix-valued function

$$\Pi(z) := (\overline{\delta}E + \theta(z)(E + \delta\theta(z))^{-1}, z \in \mathbb{C}_+$$

is analytic in $\mathbb{C}_+$ for any $\delta \in \mathbb{C}, |\delta| < 1$. If θ is a scalar function ($n = 1$), then Frostman proved that $\Pi(z)$ is Blaschke product for all δ with the possible exception of a set of zero logarithmic capacity. Ginzburg Y.P. extended this result to the matrix-valued functions θ with the same description of excepting values δ. In this case Π is matrix Blaschke product, i.e. $\det \Pi(z)$ is scalar Blashke product. If the matrix-valued function θ is entire, then Frostman-Ginzburg theorem admits correction.

Theorem. *Let θ be an arbitrary entire inner in $\mathbb{C}_+$ matrix-valued function of order n. Then the linear-fractional transformation Π is matrix Blaschke product for all $\delta(\delta \neq 0,|\delta| < 1)$ with the possible exception of at most $n-1$ values of δ.*