

ON ANALYTIC PROPERTIES OF FOURIER
TRANSFORMS OF THE FUNCTIONS ON HILBERT
SPACE WITH THE GAUSS MEASURE

Abstract

Let X be a Hilbert space with the Gauss measure μ and $L_2(X, \mu)$ be a space of functions on X summable in square. The necessary and sufficient condition is found in order that the entire analytical function $\varphi(z)$ on X be the Fourier transform of the function $f(x) \in L_2(X, \mu)$.

The notion of generalized directional derivative for the function $f(x) \in L_2(X, \mu)$ is given. It is proved that any function from $L_2(X, \mu)$ has a generalized directional derivative being an element of $L_\varepsilon(X, \mu)$.