

SPECTRAL REPRESENTATION AND EXTRAPOLATION OF STATIONARY
RANDOM PROCESSES ON LINEAR SPACES

Lutz Klotz
Manfred Riedel

Abstract: The paper deals with continuous Banach-space-valued stationary random processes on linear spaces. From von Waldenfels' [13] integral representation of positive definite functions on a linear space \mathcal{L} we derive an analogue of Stone's theorem for a group of unitary operators over \mathcal{L} . It is used to obtain spectral representations of a general Banach-space-valued stationary random process over \mathcal{L} and its covariance function. For the special class of Hilbert-Schmidt operator-valued stationary processes the explicit form of Kolmogorov's isomorphism theorem between temporal space and spectral space is established and with its aid there are studied some prediction problems. Our prediction results are similar to those proved in [5] for multivariate stationary processes on groups.

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