

THE PREDICTION THEORY OF MULTIVARIATE STOCHASTIC PROCESSES

I. THE REGULARITY CONDITION

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1. Introduction

To advance further in the prediction of multivariate (or multiple) stochastic processes, we need the support of a general theory of such processes. It is natural to try to build this theory along the lines of Kolmogorov's important development of the theory of univariate (or simple) processes [5, 6].² This work was begun in 1941 by Zasuhrin, who was able to announce some important results [18]. But even before Kolmogorov's work, Cramer [1] had obtained a fundamental theorem on the spectrum. Subsequently, Wiener [14–17], Doob [2] and Whittle [13] have studied multiple processes, but a general theory has not as yet been reached. For instance, no spectral

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² A similar development, but confined to processes with absolutely continuous spectra, was given independently by WIENER, cf. [14, p. 59].