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Central Limit Theorems for Instantaneous Filters of Linear Random Fields on
 Z^2

Cheng, Tsung-Lin; Ho, Hwai-Chung

Abstract

This note considers the stationary sequence generated by applying an instantaneous filter to a linear random field in Z^2 . The class of filters under consideration includes polynomials and indicator functions. Instead of imposing certain mixing conditions on the random fields, it is assumed that the weights of the innovations satisfy a summability property. By building a martingale decomposition based on a suitable filtration, asymptotic normality is proved for the partial sums of the stationary sequence.

Key words : Linear random fields; Central limit theorem; Martingale decomposition; ℓ -approximation