

Backward Invariance Principles in Change-Point Analysis

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Abstract

We will address dependence issues arising from nonparametric change-point analysis based on weighted approximations. Motivated by recent contributions of Ling [*Ann. Stat.* 35, 1213–1237 (2007)], we will present some new “backward” strong invariance principles for linear processes with strongly mixing errors. As a consequence, we are able to establish Darling-Erdős type limit theorems for certain weighted tied-down partial sums within an ARMA-GARCH framework. In particular, Aue, Berkes & Horváth [*Bernoulli* 12, 583–608 (2006)] proposed weight functions to detect structural breaks with better power. We will consider a complementary class of weight functions and derive related limit theorems.