

Conditional independence, conditional mixing and conditional association

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Abstract Some properties of conditionally independent random variables are studied. Conditional versions of generalized Borel-Cantelli lemma, generalized Kolmogorov's inequality and generalized Hájek-Rényi inequality are proved. As applications, a conditional version of the strong law of large numbers for conditionally independent random variables and a conditional version of the Kolmogorov's strong law of large numbers for conditionally independent random variables with identical conditional distributions are obtained. The notions of conditional strong mixing and conditional association for a sequence of random variables are introduced. Some covariance inequalities and a central limit theorem for such sequences are mentioned.

Keywords Conditional independence · Conditional mixing · Conditional association · Conditional Borel-Cantelli lemma · Generalized Kolmogorov inequality · Conditional Hájek-Rényi inequality · Conditional strong law of large numbers · Conditional central limit theorem · Conditional covariance inequality