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The summary of the PhD thesis

Exact strong laws of large numbers and their applications.

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The aim of the thesis is to present the author's results concerning the convergence (almost sure, in probabilty) of weighted sums of random variables to a certain constant different from zero. The theorems about such convergence are called the exact laws of large numbers. They appear, in particular, in the case of independent random variables that have identical distributions with an infinite expected value or an expected value equal to 0.

The first chapter will present the strong and weak exact laws of large numbers for independent and dependent random variables with different distributions.

The second chapter is devoted to the sums of weighted ratios with the same distribution with convergence almost sure and in probability.

The third chapter considers the convergence of the sums of weighted ratios of order statistics. In particular, the results on the ratios of the smallest order statistics will be presented. A result on the maxima of ratios of adjacent order statistics will also be presented.

The fourth chapter is devoted to the exact laws of large numbers for distributions of the Pareta asymmetric type with a convergence that is almost sure, in probabilty and complete.

In the last chapter, the results on the exact laws of large numbers will be extended to random fields. In the dissertation, a theorem analogous to the Chow and Robbins theorem for random fields was presented. At the moment, this is the only such result for random fields. The exact law of large numbers for random fields is also shown.

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