

LARGE DEVIATIONS OF SUMS OF RANDOM VARIABLES OF TWO TYPES

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Abstract

Let $\xi_1, \xi_2, \dots; \tau_1, \tau_2, \dots$ be two sequences of independent random variables, with ξ_i and τ_i distributed respectively as ξ and τ and with

$$\mathbf{E}|\xi| < \infty, \quad \mathbf{E}|\tau| < \infty, \quad S_n = \sum_{i=1}^n \xi_i, \quad T_m = \sum_{i=1}^m \tau_i.$$

In this article we study the asymptotics of large deviation probabilities of the sums $T_m + S_n$ for the following three classes of distribution tails for τ and ξ : regular (heavy), semiexponential, and exponentially decreasing. The numbers m and n may be either fixed or unboundedly increasing. The cause for appearance of this article is the articles [1,2] addressing a particular case of the problem under consideration.

Key words: large deviations, sum of random variables, summands of two types.

1. *Asmussen S, Klueppelberg G., and Sigman K. (1999) Sampling of subexponential times with queueing applications, Stochastic Process. Appl., v.79, N2, 265–286.*
2. *Foss S. and Korshunov D. (2000) Sampling at random time with a heavy-tailed distribution, Markov Process. Related Fields, v.6, N4, 543–568.*