

LOCAL THEOREMS FOR ARITHMETIC MULTIDIMENSIONAL COMPOUND RENEWAL PROCESSES UNDER CRAMÉR'S CONDITION

A. A. Mogul'skiĭ and E. I. Prokopenko

We continue the study of compound renewal processes (c.r.p.) under Cramér's moment condition initiated in [2–10, 12–16]. We examine two types of arithmetic multidimensional c.r.p. $\mathbf{Z}(n)$ and $\mathbf{Y}(n)$, for which the random vector $\xi = (\tau, \zeta)$ controlling these processes ($\tau > 0$ defines the distance between jumps, ζ defines the value of jumps of the c.r.p.) has an arithmetic distribution and satisfies Cramér's moment condition. For these processes, we find the exact asymptotics in the local limit theorems for the probabilities

$$\mathbb{P}(\mathbf{Z}(n) = \mathbf{x}), \quad \mathbb{P}(\mathbf{Y}(n) = \mathbf{x})$$

in the Cramér zone of deviations for $\mathbf{x} \in \mathbb{Z}^d$ (in [9, 10, 13–15], the analogous problem was solved for nonlattice c.r.p., where the vector $\xi = (\tau, \zeta)$ has a nonlattice distribution).

Key words and phrases: compound renewal process, Cramér's condition, arithmetic distribution, renewal function, deviations function, large deviations, moderate large deviations, local limit theorem.

Mogul'skiĭ Anatolij Al'fredovich
Prokopenko Evgenij Igorevich

Sobolev Institute of Mathematics,
Novosibirsk, 630090 Russia.
Novosibirsk State University,
Novosibirsk, 630090 Russia.
E-mail: mogul@math.nsc.ru
E-mail: evgenii.prokopenko@gmail.com

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