LARGE DEVIATIONS OF THE WAITING TIME FOR TANDEM QUEUEING SYSTEMS

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We consider some queueing system with two sequential servers (a tandem queueing system). Let the ergodicity conditions be satisfied. In a stationary regime denote by T_i the waiting time of the beginning of servicing at the ith, $i = 1, 2$, server. In the article we obtain some conditions for an integro-local version of the large deviation principle to hold for the vector $T = (T_1, T_2)$: given a square

$$\Delta(x) = \big\{ y = (y_1, y_2) : x_i \leq y_i < x_i + \Delta, i = 1, 2 \big\},$$

we have

$$\lim_{|x| \to \infty, \, x/|x| \to \omega} \frac{1}{|x|} \ln \mathbb{P}\big(T \in \Delta(x) \big) = -\overline{D}(\omega),$$

with $|x| = (x_1^2 + x_2^2)^{1/2}$ and $\overline{D}(\omega)$ the deviation function in explicit form.

Key words and phrases: tandem queueing system, large deviation principle (LDP), large deviations, deviation function, the ergodicity conditions, the Cramér conditions, factorization identity.

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