

Laplace-transform asymptotics of longest gaps in Poisson processes
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In a Poisson process with constant rate (also known as homogeneous Poisson process) with exponential inter-arrival (waiting time to the next event) time, the longest/largest gap, $L(t)$ which is the maximal inter-arrival time is considered in this paper. The aim was to establish the Laplace transform asymptotic and the large deviation principles related to the longest gap $L(t)$ between epochs of arrival in a homogeneous Poisson process. The result of the investigation suggest two natural and different large deviation principles for the longest gap with two distinct rate functions and speeds.

Keywords: Longest gap; Laplace transform; large deviation principle; Estimation theorem; Homogeneous Poisson process.