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On a queueing-inventory system with common life time and Markovian lead time process

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Abstract

We consider a correlated queueing-inventory system with Markovian arrival of customers, phase type distributed service time and Markovian lead time. Items in each cycle have a common life time. Before the realization of this, a purchased item in a cycle can be cancelled in that cycle itself provided inventory level has not dropped to zero. Common life time and inter-cancellation time follow independent exponential distributions. We exhaustively analyze this system. The special case of customer arrival following a Poisson process and service time exponentially distributed, is shown to yield product form solution, thus extending earlier work to the case of correlated lead time. The inventory replenishment policy is to bring the inventory level to its maximum at the lead time realization. Several numerical illustrations are provided to illustrate the system performance.

Keywords Inventory · Markovian arrival process · Reservation and cancellation · Common life time · Stochastic decomposition

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