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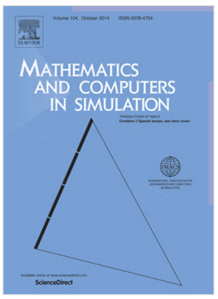


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# Two Server Markovian Inventory Systems with Server Interruptions: Heterogeneous Vs. Homogeneous Servers

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**Abstract**

This paper discusses about Markovian $(s, Q)$ inventory-queueing system with server interruptions of two heterogeneous servers. Matrix method is applied to obtain the steady state joint probability distribution of customers level in the queue, retrial group, status of the servers and stock level of heterogeneous system. This paper studies the significant effect of heterogeneous system (each server work with different service rate) as compared with homogeneous system (all servers work with same service rate). Performance measures are derived for heterogeneous system and homogeneous system. Appropriate cost functions for both models are defined. Numerical examples are used to compare the total expected cost rates of both systems. Heterogeneous system yields the minimum total expected cost value and therefore the heterogeneous system is effective.

Keywords: Markov process, Orbital search, Vacation, Heterogeneous and Homogeneous servers, Server interruptions.

## 1 Introduction

Many studies discuss on multiple server facilities with homogenous type of services in queuing - inventory system. In the study, 'Homogeneous' means the rate of service is identical for each server and the concept is fit when the service process is electronically or mechanically controlled. But it is not supposed to fit when the manpower is used. The reason is that the identical rate of service cannot be applied in our daily life whenever the human servers are used for any service.

In our work, we explore the Markovian queuing-inventory system of two heterogeneous servers with server interruptions. It is commonly understood that the service times of the identical jobs

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