

Abstracts of Australasian PhD theses

Some problems on dams and queues with correlated inputs

Pyke Tin

In this thesis we examine and extend three aspects of storage problems:

- (i) dependent inputs,
- (ii) seasonality of inputs,
- (iii) regulated outputs.

In addition, we investigate a single server queueing system whose input is closely related to that of a dam.

Chapter I is devoted to historical survey and review of known work on these topics. In Chapter II a dam of infinite capacity with a unit withdrawal is considered. It is shown that, by suitable manipulations of the equation governing the dam content process, a number of useful results can be obtained for a wide class of input processes.

Chapter III attempts to gain some explicit results for dams with Markovian inputs of a special type.

Chapter IV extends the theory to the case where the input process is seasonal as well as correlated.

Chapter V shows that a generalization of Wald's identity can be used to obtain expressions for the first emptiness probabilities of dams with correlated seasonal inputs.

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In Chapter VI we consider a problem in dam regulation.

In Chapter VII we investigate a single server queueing system in which interarrival intervals form a Markov process and service times are exponentially distributed. Among other results we find that the form of solution of queue length distribution is a simple generalization of a well-known result. Some effects of correlation coefficient of the arrival process on queueing characteristics are also studied.