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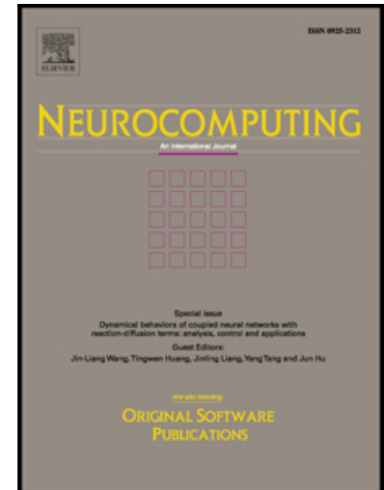
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# Fluctuation analysis of instantaneous availability under specific distribution

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## Abstract

The problem on the early fluctuation of instantaneous availability (IA) is considered in this paper, where it is for a one-unit repairable system. By transforming the renewal equation into differential equations, the instantaneous availability can be given under specific distribution. We use a fluctuation definition and several decision lemmas to analyze the fluctuation of instantaneous availability. Then we make a further research to give some methods of fluctuation suppression. The simulation results are in good agreement with the theoretical results.

*Keywords:* Instantaneous availability, Fluctuation, Renewal model

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## 1. Introduction

Availability theory as a branch of the reliability theory is derived from the competition of military equipment. With the development of science and technology, it also extends many emerging areas such as information technology, traffic communications and aerospace systems [1, 2, 3].

The research on availability has made great advances in the steady-state availability because it determines the long term performance of a system [4, 5,

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