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An eigenvalue of the repairable queueing system with three kinds of states and its application. (Chinese. English summary) [Zbl 07404475]

Summary: The asymptotic property of the time-dependent solution corresponding to a repairable queueing system with three kinds of states has been studied. Firstly, by introducing the probability generating function we prove that 0 is an eigenvalue of the operator corresponding to the queueing system. Secondly, we obtain that 0 is an eigenvalue of adjoint operator corresponding to the queueing system. Lastly, under a certain condition, we obtain that the time-dependent solution of this model converges strongly to its steady-state solution.

MSC:
35P20 Asymptotic distributions of eigenvalues in context of PDEs
60K25 Queueing theory (aspects of probability theory)
90B22 Queues and service in operations research

Keywords:
the repairable queueing system; adjoint operator; geometric multiplicity; steady-state solution