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TWO-STATION QUEUEING NETWORKS WITH MOVING SERVERS, BLOCKING, AND CUSTOMER LOSS*

WINFRIED K. GRASSMANN† AND JAVAD TAVAKOLI‡

Abstract. This paper considers a rather general model involving two exponential servers, each having its own line. The first line is unlimited, whereas the second line can only accommodate a finite number of customers. Arrivals are Poisson, and they can join either line, and once finished, they can either leave the system, or they can join the other line. Since the space for the second line is limited, some rules are needed to decide what happens if line 2 is full. Two possibilities are considered here: either the customer leaves prematurely, or he blocks the first server. The model also has moving servers, that is, the server at either station, while idle, can move to help the server of the other station. This model will be solved by an eigenvalue method. These eigenvalue methods may also prove valuable in other contexts.

Key words. Tandem queues, Generalized eigenvalues, Markov chains, Blocking.

AMS subject classifications. 60K25, 90B22, 15A22, 65F15.

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†Department of Computer Science, University of Saskatchewan, 110 Science Place, Saskatoon, Saskatchewan, Canada S7N 5C9 (grassman@cs.usask.ca).

‡Department of Mathematics and Statistics, Okanagan University College, 3333 University Way, Kelowna, BC, Canada V1V 1V7 (jtavakoli@ouc.bc.ca).