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Qiang Zhen* (q.zhen@unf.edu), 1 UNF Dr, Bldg. 14/2731, Jacksonville, FL 32224, and
Charles Knessl. *On Spectral Properties of Certain Large Matrices That Arise in the Study of
Processor Shared Queues.*

We consider sojourn or response times in processor-shared queues that have a finite population of potential users. Computing the response time of a tagged customer involves solving a finite system of linear ODEs. Writing the system in matrix form, we study the eigenvectors and eigenvalues in the limit as the size of the matrix becomes large. This corresponds to finite population models where the total population is $N \gg 1$. Using asymptotic methods we reduce the eigenvalue problem to that of a standard differential equation, such as the Hermite or Airy equation. The dominant eigenvalue leads to the tail of a customer's sojourn time distribution. (Received September 20, 2011)