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Qiang Zhen* (qzhen2@uic.edu), Dept. of Math., Stat. and Comp. Sci., University of Illinois at Chicago, 851 S Morgan St, SEO 322, Chicago, IL 60607, and **Charles Knessl**. *On Sojourn Times in the Finite Capacity M/M/1 Queue with Processor Sharing.*

We consider a processor shared $M/M/1$ queue that can accommodate at most a finite number K of customers. We give an exact expression for the sojourn time distribution in this finite capacity model in terms of a Laplace transform by using the discrete Green's function. We then give the tail behavior, for the limit $K \rightarrow \infty$, by locating the dominant singularity of the Laplace transform. The asymptotic derivation is under three scales of the traffic intensity ρ , which are $\rho - 1 = O(K^{-1})$; $\rho - 1 = bK^{-1/2}$, $b > 0$ and $\rho > 1$. (Received September 16, 2009)