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**J.S.H. van Leeuwen** and **Charles Knessl**. *On a Processor Sharing Queue That Models Balking.*

We consider the processor sharing  $M/M/1$ -PS queue which also models balking. A customer that arrives and sees  $n$  others in the system “balks” (i.e., decides not to enter) with probability  $1 - b_n$ . If  $b_n$  is inversely proportional to  $n + 1$ , we obtain explicit expressions for a tagged customer’s sojourn time distribution. We consider both the conditional distribution, conditioned on the number of other customers present when the tagged customer arrives, as well as the unconditional distribution. We then evaluate the results in various asymptotic limits. These include large time (tail behavior) and/or large  $n$ , lightly loaded systems where the arrival rate  $\lambda \rightarrow 0$ , and heavily loaded systems where  $\lambda \rightarrow \infty$ . We find that the asymptotic structure for the problem with balking is much different from the standard  $M/M/1$ -PS queue. (Received September 15, 2010)