Abstract: We consider a queuing model with the workload evolving between consecutive i.i.d. exponential timers $\{e_q^{(i)}\}_{i=1,2,...}$ according to a spectrally positive Lévy process $Y(t)$ which is reflected at 0. When the exponential clock $e_q^{(i)}$ ends, the additional state-dependent service requirement modifies the workload so that the latter is equal to $F_i(Y(e_q^{(i)}))$ at epoch $e_q^{(1)} + \ldots + e_q^{(i)}$ for some random nonnegative i.i.d. functionals $F_i$. In particular, we focus on the case when $F_i(y) = (B_i - y)^+$, where $\{B_i\}_{i=1,2,...}$ are i.i.d. nonnegative random variables. We analyse the steady-state workload distribution for this model.

Keywords: alternating service model, clearing models, reflected Lévy processes, scale functions, tail behaviour, Wiener-Hopf factorisation