

## Omega-killed Markov additive processes

In this talk, we consider the exit problems for Markov additive process  $(X, J)$  exponentially killed with the respect to the intensity  $\omega_i(x)$ , which is positive and locally bounded function. We assume that intensity  $\omega_i(x)$  depends on the state  $i$  of the Markov chain  $J$  and position of the Lévy process  $X$ . In classical approach we set  $\omega_i(x) = q$ , for every  $i \in J$ , which can be understood as a killing by independent exponentially distributed random variable with the parameter  $q$ . Furthermore, all identities will be given in terms of  $(\omega)$ -scale matrices, which are extending general one-dimensional scale functions. Finally, we will apply derived results to the dividends problem as well as present numerical results for particular examples of  $\omega_i(x)$ .