

RISK MODEL WITH AN OBSERVER IN MARKOV ENVIRONMENT

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We consider a spectrally-negative Markov additive process as a model of a risk process in random environment. Following recent interest in alternative ruin concepts, we assume that the ruin occurs when an independent Poissonian observer sees the process negative, where the rate of observations may depend on the state of the environment. This model generalizes Parisian Lévy risk models with exponential implementation delay. Mathematically, we are interested in the joint Laplace transform of the occupation times in the negative half plane corresponding to different states of the environment. We extend the quantity of interest by adding essential structure to it, which allows to employ an approximation method. Surprisingly, the resulting formulas are rather neat.