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Noncentral Pólya–Aeppli Process and Applications

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In this paper we introduce a stochastic process with a sum of homogeneous Poisson process and Pólya-Aeppli process and called it a Noncentral Pólya–Aeppli process (NPAP). The probability mass function, recursion formulas and some properties are derived. As application we consider a risk model with NPAP counting process. The joint distribution of the time to ruin and deficit at the time of ruin is defined. The differential equation of the ruin probability is given. As example we consider the case of exponentially distributed claims.

References

[1] Chukova S. and Minkova L. D. Characterization of the Pólya–Aeppli process, *Stochastic Analysis and Applications*, 31, 2013, 590–599.

[2] Grandell J. *Mixed Poisson Process*, Chapman & Hall, London, 1997.