

Inhomogeneous phase-type constructions, matrix distributions and the modeling of heavy-tailed risks

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Abstract. In this talk we discuss the extension of the construction principle of phase-type (PH) distributions to allow for inhomogeneous transition rates and show that this naturally leads to direct probabilistic descriptions of certain transformations of PH distributions. In particular, the resulting matrix distributions enable to carry over fitting properties of PH distributions to distributions with heavy tails, providing a general modeling framework for heavy-tail phenomena. We also discuss related randomized versions and illustrate the versatility and parsimony of the proposed approach for the modeling of real-world insurance data sets.