

Analytical and statistical properties of tempered stable Lévy processes

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Abstract:

Tempered stable processes form a class of Lévy processes which allows many explicit calculations and includes several wellknown classes of Lévy processes like Variance Gamma-, bilateral Gamma- and CGMY-processes. It is a six parameter family with Lévy measure

$$\nu(dx) = \left[\frac{\alpha^+}{x^{1+\beta^+}} e^{-\lambda^+ x} \cdot \mathbb{1}_{x>0} + \frac{\alpha^-}{|x|^{1+\beta^-}} e^{-\lambda^- |x|} \cdot \mathbb{1}_{x<0} \right] dx$$
$$\alpha^+, \alpha^-, \lambda^+, \lambda^- > 0; \quad \beta^+, \beta^- \in [0, 1).$$

In the talk asymptotic normality of these processes together with convergence rate, laws of large numbers and properties of the densities are presented. Several parameter estimators are derived. Applications to mathematical finance are shown.