



## Exit Problems for Lévy and Markov Processes with One-Sided Jumps and Related Topics

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Deadline for manuscript  
submissions:

**closed (30 September 2019)**

### Message from the Guest Editor

It has long been well-known that exit problems for one-dimensional Lévy processes are easier when there are jumps in one direction only. In the last few years, this intuition became more precise: a great variety of identities for exit problems of spectrally-negative Lévy processes may be ergonomically expressed in terms of two “ $q$ -harmonic functions” (or scale functions, or positive martingales)  $W$  and  $Z$ . The proofs typically require not much more than the strong Markov property and hold in principle for the wider class of spectrally-negative strong Markov processes.

Motivated by these considerations, this Special Issue aims to review and push further the state-of-the-art on the following topics:

- $W$ ,  $Z$  formulas for exit problems of the Lévy and diffusion classes (including drawdown problems)
- $W$ ,  $Z$  formulas for quasi-stationary distributions
- Asymptotic results
- Extensions to random walks, Markov additive processes, Omega models, processes with Parisian reflection or absorption, processes with state-dependent drift, etc.
- Optimal stopping, dividends, real options, etc
- Numeric computation of the scale functions





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