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*Conditioned stable Lévy processes and the ruin problem*

In order to construct several interesting examples of Lévy processes, we work with the Lamperti transformation between Lévy processes and positive self-similar Markov processes.

By killing a stable Lévy process when it enters the positive half line, or by conditioning it to stay positive, or by conditioning it to hit 0 continuously, we obtain different positive self-similar Markov processes. We compute the infinitesimal generator of each of them and we also obtain, using the Lamperti's transformation, the corresponding Lévy processes and the characteristics of them.

As an application we obtain explicitly the law of the minimum before an independent exponential time, for some of these Lévy processes. This provides the explicit form of the spatial Wiener–Hopf factorization at a particular point and the value of the ruin probability for these processes.

This is based on a joint paper (to appear) with Loic Chaumont.