

Intrinsic scaling properties of jump processes

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Scaling properties play a fundamental role for many reasons. Often, a scaling property is characterised by a real number, e.g. the index of stability when studying stable processes. In the talk we study phenomena where this is not possible, e.g. the exit time estimates of geometric stable processes. These estimates are applied to questions of regularity for generators of Markov processes and growth lemmas for corresponding integro-differential equations. The generators are allowed to have an arbitrary order of differentiability less than 2. We explain that, in general, this order is represented by a function and not by a number. Our approach enables a careful study of regularity issues up to the phase boundary between integro-differential (positive order of differentiability) and integral operators (no differentiability).