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Speed of explosion for continuous-state branching processes with nonlinear branching mechanism

Continuous-state branching process (CSBP) with nonlinear branching mechanism is the unique nonnegative solution to certain stochastic differential equation driven by Brownian motion and (or) Poisson random measure. It can also be obtained from spectrally positive Lévy processes by a generalized Lamperti transform. These generalized CSBPs allow rich asymptotic behaviors such as extinction, explosion and coming down from infinity. The explosion behaviors for nonlinear CSBPs have been studied by Li and Zhou (2021) when the big jumps of the process have a finite first moment. In this talk we further consider the explosion behaviors for processes with jumps of infinite first moment. In particular, we identify the speed of explosion when the associated Laplace exponent and the rate function are both regularly varying. This talk is based on joint work with Clement Foucart and Bo Li.