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*Boundary behaviors for continuous-state nonlinear branching processes*

We consider a class of continuous-state branching processes with nonadditive branching mechanism. Such a process arises as nonnegative solution to a generalized version of the stochastic differential equation (driven by both a Brownian motion and a spectrally positive Poisson random measure) for the classical continuous-state branching process. We present quite sharp conditions on parameters of the SDE under which extinction, explosion or coming down from infinity occurs, respectively, to these processes.

The talk is based on joint work with Pei-Sen Li and Xu Yang.