SPINE DECOMPOSITION AND $L \log L$ CRITERION FOR SUPERPROCESSES WITH NON-LOCAL BRANCHING MECHANISM

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Abstract: In this talk, I will describe a pathwise spine decomposition for superprocesses with both local and non-local branching mechanisms under a martingale change of measure. This result complements the related results obtained in Evans (1993), Kyprianou et al. (2012) and Liu, Ren and Song (2009) for superprocesses with purely local branching mechanisms and in Chen, Ren and Song (2016) and Kyprianou and Palau (2016) for multitype superprocesses. As an application of this decomposition, we obtain necessary/sufficient conditions for the limit of the fundamental martingale to be non-degenerate. In particular, we obtain extinction properties of superprocesses with non-local branching mechanisms as well as a Kesten-Stigum $LlogL$ theorem for the fundamental martingale.

The talk is based on a joint work with Renming Song and Ting Yang.