

CONTINUOUS-STATE BRANCHING PROCESSES, EXTREMAL PROCESSES AND SUPER-INDIVIDUALS

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Abstract: The talk is based on a joint work [4] with Chunhua Ma (Nankai university). We consider the population model associated to continuous-state branching processes (as Bertoin and Le Gall in [1], Dawson and Li [2], Duquesne and Labbé [3]). The aim of the talk is to understand how the growth of the population is locally organized. The population model is described in terms of flows of CSBPs, and its long-term behaviour through subordinators and *extremal processes*. The main contribution is to characterize these extremal processes and to give them an interpretation in terms of the population. Extremal processes arise in the case of supercritical processes with *infinite mean* and of subcritical processes with *infinite variation*. The jumps of these extremal processes are interpreted as specific initial individuals whose *progenies are overwhelming*. These individuals are called *super-individuals* and correspond to the records of a certain Poisson point process embedded in the flow. They radically increase the growth rate to ∞ in the supercritical case, and they slow down the rate of extinction in the subcritical one. This notion of super-individuals allows us in particular to recover the so-called *Eve property* (defined in Duquesne and Labbé [3]).

References

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