

TWO-SEX BRANCHING POPULATIONS

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ABSTRACT

In the general framework of stochastic modeling, the theory on branching processes provides mathematical models to describe the demographic dynamics of populations whose size evolves over time, due to random births and deaths. Branching models are an active research area of theoretical and practical interest with applicability to such fields as biology, epidemiology, genetics, population dynamics, and others. They have especially played a major role in modeling population dynamics. We focus here the interest on discrete-time branching models describing the demographic dynamics of sexual reproduction populations. Such populations are formed by two disjoint classes: females and males. Two important biological phases are considered, the mating phase where the couples female-male are formed, and the reproduction phase in which each couple produces new female and male offspring according to certain offspring probability distribution. This research line was initially considered in [1] where the bisexual Galton-Watson branching model was introduced. From then on, several classes of two-sex branching models have been investigated, see [2]. In this talk, we provide a general information about two-sex branching models, review the recent contributions concerning such a class of stochastic models, and comment some questions for research.

References

- [1] D.J. Daley (1968) *Extinction conditions for certain bisexual Galton-Watson branching processes*, Z. Wahrscheinlichkeitsth. Verw. Geb., Volume 9, pp. 315–322.
- [2] M. Molina (2010) *Two-sex branching process literature*, Lect. Notes Statist., Volume 197, pp. 279–293.