

PARTICLE SYSTEMS AND QUASI-STATIONARY DISTRIBUTIONS

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Nothing lasts forever. However many phenomena can be well described by a process which enters a quasi-stationary state before eventually vanishing. Since the pioneering work of Kolmogorov and Yaglom, a lot of work has been dedicated to understand the quasi-stationary behavior of Markov processes through the invariant distributions (Quasi-Stationary distributions) of the conditioned evolution. Unlike invariant distributions, QSD are solutions of a non-linear equation and there can be 0, 1 or an infinity of them. Also, they cannot be obtained as Cesaro limits of Markovian dynamics. These facts make the computation of QSDs a nontrivial matter.

We study different particles systems (Branching particles, Branching with selection, Fleming Viot systems) allowing to simulate QSD distributions. We also derive and explain some links with the existence of traveling waves for some specific PDEs.