The correlation functions for some Markov evolutions

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The analysis based on the correlation functions are used to study the evolution of the infinite continuum birth-and-death systems of point particles. In our case like in [3] entities are characterised by two features, special trait $x \in \mathbb{R}^d$ and age $a_x \geq 0$. With age the survival probability and strength of reproduction are changing. Due to this fact the birthrate at a given point of the space varies according to the distance to the points where other particles exist and their age. The states of the system are described in terms of probability measures on the corresponding configuration space.

The systems of point particles are commonly used in mathematical physics, especially in statistical mechanics. The set of indistinguishable points well describes gases, dust grains and fluids in a microscopic way.

REFERENCE

[1] D. Jasińska, A spatial individual-based birth and death model in continuum with age structure, Ann. Univ. Mariae Curie-Skłodowska Sect. A, 71, 41-54 (2017)

[2] Ch. Berns Y. Kondratiev Y. Kozitsky, O. Kutoviy, Kawasaki Dynamics in Continuum: Micro- and Mesoscopic Descriptions, Journal of Dynamics and Differential Equations, 25, 1027-1056 (2013)

[3] S. Méléard, V. Tran, Slow and fast scales for superprocess limits of age-structured populations, Stochastic Processes and their Applications, 122, 250-276 (2012)

[4] Y. Kondratiev, T. Kuna, Harmonic analysis on configuration space. I. General theory, Infinite Dimensional Analysis, Quantumn Probability and Related Topics, 5, 201–233 (2002).