



Sandomierz, 5th–9th September 2016

A SPATIAL INDIVIDUAL-BASED BIRTH AND DEATH MODEL WITH AGE STRUCTURE

Dominika Jasińska

Faculty of Mathematics, Physics and Computer Science
Maria Curie-Skłodowska University in Lublin
pl. Marii Curie-Skłodowskiej 5, 20-031 Lublin
jasdominika@.pl

ABSTRACT

The Markov generator approach and the analysis based on correlation functions [2] are used to study the evolution of systems consisting of infinite number of interacting particles in continuum. The behaviour of the population is described on \mathbb{R}^d . The states of the system are probability measures on the configuration space. The evolution of states is described by appropriate Fokker-Planck equation [3,4].

Each particle is described by its location and age. The birth rate at a given point of the space varies according to the distance to the points where other particles exist and their age. 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.

REFERENCES

- [1] D. Jasińska: *A spatial individual-based birth and death model in continuum with age structure* (in preparation).
- [2] Y. Kondratiev, O. Kutoviy, and S. Pirogov: *Correlation functions and invariant measures in continuous contact model*, *Infin. Dimens. Anal. Quantum Probab. Relat. Top.* **11** (2008), 231–258.
- [3] D.L. Finkelshtein, Y.G. Kondratiev, and M.J. Oliveira: *Markov evolutions and hierarchical equations in the continuum I. One-component systems*, *J. Evol. Equ.* **9** (2009), 197–233.
- [4] Y. Kondratiev and Kozitsky Y.: *The evolution of states in a spatial population model*, *J. Dynam. Differential Equations* **10** (1), 2016.