Coalescing random jumps in the mesoscopic description

chosen results of numerical simulations

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An individual-based model of infinitely many entities in $\mathbb{R}^d$ is discussed. The individuals are jumping with repulsive influence of others and freely coalescing. During the single action of coalescence, exactly two entities can merge. The dynamics of the system can be described at the microscopic scale as evolution of sub-Poissonian measures on configuration space Γ, as in [1]. Instead of microscopic dynamics, one can study a Poisson approximation of the system and its evolution at the mesoscopic scale. Such approximation can be obtained by means of the Vlasov scaling, see [2]. In order to study the dynamics of the system in more details, numeric simulations of mesoscopic dynamics were performed. The main focus of the talk is to present the results of these simulations, in particular the possibility of persisting spatial heterogeneity emergence in the absence of coalescence and how the introduction of merging affects this phenomenon, as well as some simple examples of non-trivial stationary states in the case of pure coalescence that are very sensitive to any addition of jumps.

REFERENCE

[1] Y. Kozitsky, K.Pilorz, *Random jumps and coalescence in the continuum: evolution of states of an infinite system*, arXiv:1807.07310 (2018)

[2] K.Pilorz, *A kinetic equation for repulsive coalescing random jumps in continuum*, Annales Universitatis Mariae Curie-Sklodowska, sectio A – Mathematica, 70, 47-74 (2016)