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On kinetic evolution of interacting cells modeling systems in mathematical biology

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We develop a new approach to the description of the collective behavior of many-cell (many-entity) systems within the framework of the evolution of marginal observables. The developed approach is based on the methods of the kinetic theory of active particles, which shows the ability to retain various complexity features.

The obtained results are applied to the problem of the description of the typical macroscopic (hemokinetic) properties of the blood flows.

One of the advantage of the developed approach is the possibility to construct nonlinear kinetic equations in scaling limits, involving correlations of cells at initial time which characterize the condensed states of interacting cells modeling systems in mathematical biology.

We note also that a such approach is also related to the problem of a rigorous derivation of the non-Markovian kinetic-type equations from underlaying many-cell dynamics which make it possible to describe the memory effects of the kinetic evolution of cells.

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