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Markov dynamics and kinetic equations in continuum: generating functionals approach

We propose an approach to the construction of random evolutions for interacting particle systems in continuum. This method is based on the analysis of evolutionary equations for generating functionals corresponding to states of considered systems. Using techniques of infinite dimensional complex analysis, we state the convergence of a rescaled dynamics to the solution of a limiting generating functional equation. The latter leads to a non-linear non-local evolutionary equation for the particle density of the system.