Effects of a stochastic resetting on a Brownian particle and on the coagulation-diffusion process.

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Stochastic resetting occurs quite commonly in daily life. An often-met instance concerns when searching for some object. In a remarkable work, Evans and Majumdar (EM) [1] have explored the consequences of stochastic resetting in simple diffusion of a single random walker on a line. While undergoing the random walk, the particle is reset to its initial position with a rate r. EM showed that the statistical properties of the random walk are drastically altered by the resetting. For example, in the long-time limit, the stationary distribution of the particle with reset is no longer gaussian and the mean time to find a target at the origin becomes finite whenever $r > 0$ and actually has a mininum at some non-trivial value $r^* \neq 0$ [1].

In this work [2], we extend the study in order to see the influence of the reset on many body systems. More specifically, the effects of a stochastic resetting to an initial configuration is studied in a many body system : the exactly solvable coagulation-diffusion process. A finite resetting rate leads to a modified non-equilibrium stationary state. If, in addition, the input of particles at a fixed given rate is admitted, a competition between the resetting and the input rates leads to a non-trivial behaviour of the particle-density in the stationary state.

[1] M.R. Evans and S.N. Majumdar, Phys. Rev. Lett. **106**, 160601 (2011).
[2] X. Durang, M. Henkel and H. Park, J. Phys. A: Math. Theor. **47** 045002 (2014).