Some exact results in branching and annihilating random walks

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Abstract:

I will present some recent results on the behaviour of branching and annihilating random walks, belonging to two important out-of-equilibrium universality classes. We performed a perturbative expansion in the branching rate around the non-trivial pure annihilation model, for which we can solve any correlation function using techniques from the functional renormalization group. This perturbative expansion around a non-Gaussian fixed point allows us to obtain some exact results for small branching rate. In particular, we compute exactly the non-universal threshold value for having a phase transition for BARW system in the directed percolation universality class, and we also show the parity conserving universality class to have an unexpected RG fixed point structure.