

Frog model with Poisson initial configuration on homogeneous tree

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Abstract

We consider the following discrete-time particle system on the homogeneous tree known as the frog model. At time zero, there is a random number of particles at each vertex of the tree; only the particles located at the root are active, the others are inactive. Active particles perform independent discrete-time random walks with probability of disappearance $(1 - p)$ at each moment. An inactive particle becomes active once its vertex is visited by an active particle. We are interested in the case where the initial number of particles at each vertex is distributed according to iid Poisson random variable of mean μ and we prove a phase transition result for this model, by stating explicit bounds for the critical probability.

References

- [1] LEBENSZTAYN, É., MACHADO, F.P. & POPOV, S , *An improved upper bound for the critical probability of the frog model on homogeneous trees*, J Stat Phys (2005) 119: 331.