Liggett, Thomas M.

Distributional limits for the symmetric exclusion process. (English) Zbl 1172.60031

Stochastic Processes Appl. 119, No. 1, 1-15 (2009).

In the recent seminal paper by *J. Borcea, P. Bränden* and *T. M. Liggett* ["Negative dependence and the geometry of polynomials." J. Am. Math. Soc. 22, 521–567 (2009)] it is shown that a so called strong Rayleigh property (enjoyed by product measures) is preserved by (evolution of) the symmetric exclusion process η on a countable set. For the background on η see Ch.VIII of the monograph [*T. M. Ligget*, Interacting Particle Systems. Grundlehren der Mathematischen Wissenschaften, 276. (New York) etc.: Springer-Verlag. (1985; Zbl 0559.60078)]. Using this fact the author proves convergence to Poisson and Gaussian laws for functionals (in partial sums) of the process η by establishing bounds for covariances. One benefits from the coincidence of distributions of $\sum_{i\leq n}\eta_i, n\in\mathbb{N}$, under a strong Rayleigh probability measure μ on $\{0,1\}^n$, with those of sums of n independent Bernoulli variables.

Note that the strong Rayleigh property, equivalent to stability of generating polynomial for μ, entails negative association and other related properties. An auxiliary result implying preservation of stability by η is proved as well.

Reviewer: Andrej V. Bulinski (Moskva)

MSC:

60K35 Interacting random processes; statistical mechanics type models; percolation theory

Cited in **5** Documents

Keywords:

exclusion processes; negative association; negative dependence; convergence to the Poisson and Gaussian distributions; stability of polynomials

Full Text: DOI arXiv

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