Liggett, Thomas M.

Coexistence in threshold voter models. (English) Zbl 0814.60094

Ann. Probab. 22, No. 2, 764-802 (1994); correction ibid. 27, No. 4, 2120-2121 (1999).

Author's summary: The considered threshold voter models are special cases of the nonlinear voter models which were introduced recently by *J. T. Cox* and *R. Durrett* [in: Random walks, Brownian motion, and interacting particle systems, Prog. Probab. 28, 189-201 (1991)]. They are spin systems on Z^d with transition rates

$$c(x,\eta) = \begin{cases} 1, & \text{if there is a } y \text{ with } \|x-y\| \le N \text{ and } \eta(x) \ne \eta(y), \\ 0, & \text{otherwise.} \end{cases}$$

This system is known to cluster if $N = d = 1$, and to coexist if $N \ge 4$ in one dimension and if N is reasonably large in other dimensions. Cox and Durrett conjectured that it coexists in all cases except $N = d = 1$. We prove this conjecture. The proof is based on comparisons with threshold contact processes. The hard part of the proof consists of showing that the second nearest neighbor threshold contact process in one dimension with parameter 1 survives. The proof of this result is modeled after the proof by Holley and Liggett that the critical value of the basic contact process in one dimension is at most 2. By comparison with that proof, however, the fact that the interaction is not of nearest neighbor type presents substantial additional difficulties. In fact, part of the proof is computer aided.

Reviewer: L.G.Gorostiza (Mexico City)

MSC:

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