Alves, Caio; Baldasso, Rangel

**Sharp threshold for two-dimensional majority dynamics percolation.** (English. French summary) Ann. Inst. Henri Poincaré, Probab. Stat. 58, No. 4, 1869-1886 (2022)

Summary: In this work we consider the two-dimensional percolation model arising from the majority dynamics process at a given time $t \in \mathbb{R}_+$. We show the emergence of a sharp threshold phenomenon for the box crossing event at the critical probability parameter $p_c(t)$ with polynomial size window. We then use this result in order to obtain stretched-exponential bounds on the one-arm event probability in the subcritical phase. Our results are based on differential inequalities derived from the OSSS inequality, inspired by the recent developments by Ahlberg, Broman, Griffiths, and Morris and by Duminil-Copin, Raoufi, and Tassion. We also provide analogous results for percolation in the voter model.

**MSC:**
60K35 Interacting random processes; statistical mechanics type models; percolation theory
82C27 Dynamic critical phenomena in statistical mechanics
82C43 Time-dependent percolation in statistical mechanics

**Keywords:**
opinion dynamics; percolation; sharp thresholds

**Full Text:** DOI arXiv Link

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