Calculating the Velocity Exponent of Magnetic Domain in Explosive Percolation by the Sudden Bridging Growth Model

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Abstract

One of the concepts of the nanoscale is the movement of the magnetic domain wall, and it is used in various areas, for example, storage of data in memory. Magnetic fields begin to move due to external factors, such as external magnetic fields or current, and at the start of the motion, the motion of the magnetic domain wall acts as a power function to external factors, which is called the creep exponent. In this paper, we have tried to simulate the domain wall movement with the use of the explosive percolation or sudden bridging as the new model in percolation, and using the Monte Carlo method, the creep exponent of the movement of the magnetic wall during the simulation is obtained. The magnitudes of this exponent are reported according to empirical experiments and various simulations as different numbers, which 2.2 has been obtained in this model.

Keywords: magnetic domain wall, velocity exponent, explosive percolation, sudden bridging growth.

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