Abstract Submitted
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Conjecture of Alexander and Orbach.[1] JAYANTA RUDRA, Oklahoma School of Science and Mathematics, CURTIS DOIRON — The dynamical properties of fractal networks have received wide range of attention. Works on this area by several pioneering authors[1−2] have led to the introduction of the *spectral dimension* that dictates the *dynamic* properties on a fractal lattice. Most of the studies involving spectral dimension have been performed on a type of fractal lattice known as *percolation* network. Alexander and Orbach[2] conjectured that the spectral dimension might be exactly 4/3 for percolation networks with Euclidean dimension $d_e \geq 2$. Recent numerical simulations, however, could not decisively prove or disprove this conjecture, although there are other indirect evidences that it is true. We apply a stochastic approach[3] to determine the spectral dimension of percolation network for $d_e \geq 2$ *a*nd check the validity of the Alexander-Orbach conjecture. Our preliminary results on 2- and 3-dimensional percolation networks indeed show that Alexander-Orbach conjecture is true, resolving a long-standing debate. References: 1. P. G. deGennes, La Recherche 7 (1976) 919. 2. S. Alexander and R. Orbach, J. Phys. Lett. (Paris) 43 (1982) L625. 3. J. Rudra and J. Kozak, Phys. Lett A 151 (1990) 429.

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