On effective conductivity on $\mathbb{Z}^d$ lattice. (English summary)

Dedicated to David Ruelle and Yasha Sinai on the occasion of their 65th birthdays.


Summary: “We study the effective conductivity $\sigma_e$ for a random wire problem on the $d$-dimensional cubic lattice $\mathbb{Z}^d$, $d \geq 2$, in the case when random conductivities on bonds are independent identically distributed random variables. We give exact expressions for the expansion of the effective conductivity in terms of the moments of the disorder parameter up to the fifth order. In the 2D case, using the duality symmetry we also derive the sixth order expansion. We compare our results with the Bruggeman approximation and show that in the 2D case it coincides with the exact solution up to the terms of fourth order but deviates from it for the higher-order terms.”

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References


Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

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