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Dynamics of Non-interacting System with Long-Range Correlated Quenched Impurities

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Abstract: The theoretic renormalization group approach is applied to the study of the critical behavior of non-interacting system with long-range correlated quenched impurities, which has a power-like correlations $r^{-(d-\rho)}$. To two-loop order, the asymptotic scaling laws and the critical exponents are studied in the frame of a double (ε, ρ) expansion with ρ of order $\varepsilon=4-d$. In $d<4$, it is argued that the initial slip exponent $\theta=0$ together with the dynamic exponent $z<2$ is exact in this kind of random system.

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Key words: non-interacting system, critical dynamics, long-range correlated quenched impurities

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