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Random Transverse Ising Model on Annealed Complex Networks GINESTRA BIANCONI, Northeastern University — In order to shed light on critical phenomena on cuprates, here we propose a stylized model capturing the essential characteristics of the superconducting-insulator transition of a highly dynamical, heterogenous granular material: the Disordered Quantum Tranverse Ising Model (DQTIM) on Annealed Complex Network. We show that when the networks encode for high heterogeneity of the expected degrees described by a power law distribution, the critical temperature for the onset of the supercoducting phase diverges to infinity as the power-law exponent γ of the expected degree distribution is less than 3, i.e. $\gamma < 3$. Moreover we investigate the case in which the critical state of the electronic background is triggered by an external parameter g that determines an exponential cutoff in the power law expected degree distribution characterized by an exponent γ. We find that for $g = g_c$ the critical temperature for the supercondutor-insulator transition has a maximum if $\gamma > 3$ and diverges if $\gamma < 3$.

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