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Lower-Critical Spin-Glass Dimension from 23 Sequenced Hierarchical Models MEHMET DEMIRTAS, Sabanci University and Cornell University, ASLI TUNCER, Istanbul Technical University, A. NIHAT BERKER, Sabanci University and MIT — The lower-critical dimension for the existence of the Ising spin-glass phase is calculated, numerically exactly, as $d_L = 2.520$ for a sequence of hierarchical lattices, from an essentially exact (correlation coefficent $R^2 = 0.999999$) near-linear fit to 23 different diminishing fractional dimensions. To obtain this result, the phase transition temperature between the disordered and spin-glass phases, the corresponding critical exponent y_T, and the runaway exponent y_R of the spin-glass phase are calculated for consecutive hierarchical lattices as dimension is lowered.[1]

[1] M. Demirtas, A. Tuncer, and A.N. Berker, Phys. Rev. E 92, 022136 (2015).

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