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The transmission of a quantum particle through 2D disordered clusters. MD ISLAM, HISAO NAKANISHI, Purdue University — We study quantum percolation model in two dimensions by directly calculating the conductance of finite disordered clusters. In extrapolating to the limit of very large clusters we find evidence that states are localized for any amount of disorder except at the limit of zero disorder where resonance transmission may occur. The nature of localization, however, depends on the amount of disorder present in the clusters. When disorder exceeds certain critical value, transmission decreases exponentially with the size of the clusters whereas below that value it is consistent with power laws. We also investigate how the energy affects the transmission in 2D disordered systems.

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