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Vacancy localization in the square dimer model MARK BOWICK, Syracuse University, JEREMIE BOUTTIER, EMMANUEL GUITTER, Saclay, MONWHEA JENG, Syracuse University — We study the classical dimer model on a square lattice with a single vacancy by developing a graph-theoretic classification of the set of all configurations which extends the spanning tree formulation of close-packed dimers. The motion of a vacancy induced by dimer slidings is analyzed including the size distribution of the domain accessible to the vacancy and the probability for a vacancy to be strictly jammed in an infinite system. More generally, the size distribution of the domain accessible to the vacancy is characterized by a power law decay with exponent 9/8. In a finite system, the probability that a vacancy in the bulk can reach the boundary falls off as a power law of the system size with exponent $1/4$. The resultant weak localization of vacancies still allows for unbounded diffusion with a diffusion exponent related to that of diffusion on spanning trees.

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