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Vacancy diffusion in a triangular lattice model M. JENG, M. BOWICK, Syracuse University, W. KRAUTH, Laboratoire de Physique Statistique, Ecole Normale Superieure, J. M. SCHWARZ, X. XING, Syracuse University — We study vacancy diffusion in the classical triangular lattice dimer model, subject to the kinetic constraint that dimers can only translate, but not rotate. A single vacancy—i.e. a monomer—in an otherwise fully packed lattice, is always localized in a tree-like structure. The distribution of tree sizes is asymptotically exponential and has an average of 8.16 ± 0.01. A connected pair of monomers has a finite probability of being delocalized. When delocalized, the diffusion is anomalous: $\langle \vec{r}^2 \rangle \propto t^\beta$, with $\beta = 0.46 \pm 0.05$. The same diffusion law is also exhibited by clusters of three or four monomers. It is found that both swap motions (translations of dimers transverse to their axes) and glide motions (translations of dimers parallel to their axes) are essential for the large-scale diffusion of monomers.

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