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Phase separation and crystallization in doped quantum dimer models STEFANOS PAPANIKOLAOU, ERIK LUIJTEN, EDUARDO FRADKIN, University of Illinois, Urbana-Champaign — By employing analytical methods and Monte Carlo simulations, we study generalized doped quantum dimer models with exact ground-state wavefunction amplitudes that are given by the weights of generic two-dimensional classical partition functions. We derive the phase diagram of these models in the coupling-density plane. At low doping, liquid and solid phases are separated by continuous transitions, but beyond a tricritical point the transition becomes first order. We focus on the properties of high-doping regions where solid-liquid phase coexistence is observed and analyze the fate of these regions under the introduction of additional interactions. 1. S. Papanikolaou, E. Luijten and E. Fradkin, cond-mat/0607316, 2. S. Papanikolaou, E. Luijten and E. Fradkin (in preparation).

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