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Exact Stripe, Checkerboard and Droplet Ground States in Two Dimensions ZSOLT GULACSI[1], Department of Theoretical Physics, University of Debrecen, Hungary, MIKLOS GULACSI, Department of Theoretical Physics, Australian National University Canberra, Australia — Exact static non-degenerated stripe and checkerboard ground states are obtained in a broad concentration range below quarter filling in two dimensions, in the frame of a two-band type model containing Hubbard type of interactions. The random droplet states also present in the degenerated ground state, are eliminated in exact terms by extension terms of different physical origin such as dimerization, periodic charge displacements, density waves or distorsion lines. Since stripes and checkerboards are observed in a broad spectrum of materials, we were primarly interested in ground states which exhibit these inhomogeneities and less in the properties of the homogenous phases in which they appear. The procedure itself is based on a positive semidefinite decomposition of the Hamiltonian, which allows the deduction of exact ground states for non-integrable quantum mechanical many-body systems, being previously successfully applied even in 3D (Zs. Gulacsi, D. Vollhardt, Phys. Rev. Lett. **91**,186401,(2003)), or disordered and interacting systems in 2D (Zs. Gulacsi, Phys. Rev. **B69**,054204,(2004)).

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