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Authors:	<a href="#">Baruah, Tushar</a>
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Abstract:	The Attractive Hubbard Model (AHM) is a simple yet significant model for studying various quantum materials, including superconductors. The model exhibits a rich array of phases and regimes, and we explore the various possible superconducting phases of this model. We focus on the superconducting order parameters, and a numerical approach based on free energy minimisation and self-consistent BdG equations is employed. Our results observe states with oscillating order parameters: the FFLO states when an external magnetic field is applied to a 1-dimensional AHM. When the 1D AHM is extended with nearest neighbour interactions (extended AHM), it exhibits extended s-wave and p-wave pairing. In two dimensions, the d-wave pairing order parameter is also observed in the extended AHM on a square lattice. Investigating the 2D extended AHM on a Lieb lattice promises more exotic superconducting order parameters.
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