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Hidden symmetries in the HFB norm overlap functions

The mathematical structure of the Onishi formula for the HFB norm overlap functions is discussed from a viewpoint of the perfect square.

The perfect square here means a kind of polynomials consisting of the Bogoliubov matrix elements. Based on the mathematical analysis, the long-standing “sign problem” associated with the square root in the Onishi formula is considered in comparison with the other formulae, such as the Neergaard-Wust formula and Robledo’s Pfaffian formula. A new formula, which is free of the sign problem is also presented, which can be the most efficient computational method in numerical applications.

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