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Ground-state energies of the open and closed $p + ip$ -pairing models from the Bethe Ansatz

We first study the $p+ip$ Hamiltonian isolated from its environment and consider the case of large particle number. A continuum limit approximation is applied to compute the ground-state energy. We discuss the evolution of the solution curve, and the limitations of this approach. We then consider an alternative approach which generalises to accommodate interaction with the environment.