# BOUND STATES OF FERMIONS ON 2D LATTICE IN A DILUTE LIMIT

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We examine extended bound states in a dilute limit of the extended Hubbard model including the next nearest neighbour (nnn) hopping as well as the nn and nnn interactions on the two dimensional square lattice. By the exact solution of the two-body problem we have determined the binding energies, mobilities and dispersion curves across the Brillouin zone for bound states of various symmetries. It turns out that the $d$–wave pairing is strongly favored by the nnn hopping and the intersite local pairs can have small effective masses, which may imply a high condensation temperature. Our results for the extended $s$-wave ($s^*$) pairs are directly related to the stability of $s^*$-wave superconductivity in a dilute limit on 2D lattice. We have also found a possibility of $s^*$–$d_{x^2-y^2}$ mixing of the bound states.

9.7 cm

13.4 cm

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