Erratum: Quantum liquid of repulsively bound pairs of particles in a lattice

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We have detected an error in the definition of dimer energy. Given a single dimer (pair of bosonic particles) at site $j$, $|2_j\rangle$, an adiabatic elimination of nonresonant state $|1_j\rangle|1_i\rangle$ (with $i$ denoting a site adjacent to $j$) results in an energy shift of the dimer state $|2_j\rangle$ equal to $J^{(2)}$. Since the dimer is surrounded by $2d$ empty sites, each shifting its energy by $J^{(2)}$, the correct expression for the dimer energy is $2e+U+2dJ^{(2)}$.

Thus, at the end of Sec. II, the expression $2e+U+J^{(2)}$ should be replaced by $2e+U+2dJ^{(2)}$.

Next, in Eq. (6) the first term on the right-hand side should read $(2e+U+2dJ^{(2)})\sum \hat{n}_j$, which also follows from the (correct) Eq. (2).

Finally, after Eq. (8), the effective magnetic field should read $h_z=2dJ^{(2)}-\frac{1}{4}(2e+U+2dJ^{(2)})$.

These errors do not alter the results and conclusions of the paper.