# Non-standard Hubbard model and two-electron pairing

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Consistent derivation of the Tunneling Hamiltonian and related Wannier functions in terms of small-parameter expansion is presented. The results are confirmed by numerical simulations for the exactly solvable model. In the case of many-particle interaction we reproduce the standard Hubbard Hamiltonian together with the additional non-standard terms representing the density-induced single tunneling and pair-tunneling processes. We demonstrate that in the case of repulsive interaction the density-induced tunneling can cancel the single-particle tunneling amplitude. It results in complete inhibition of the single particle hopping between neighboring sites, which might be an 1D analogue of a flat band in the twisted bi-layer graphene systems. Nevertheless the particle transition between different sites can proceed due to the coherent pair-tunneling generated by the non-standard Hubbard Hamiltonian. Such a process can be considered as a "perfect" two-electron pairing, which would be equivalent to an appearance of the two-electron bound-state generated by a repulsive interaction.