

Molecular bound states of the correlated quantum dots

T. Domański,¹ K. Wrześniewski,² G. Górski,³ and I. Weymann²

¹*Institute of Physics, M. Curie-Skłodowska University, 20-031 Lublin, Poland*

²*Institute of Physics, University of Rzeszów, 35-310 Rzeszów, Poland*

³*Institute of Spintronics and Quantum Information,
A. Mickiewicz University, 61-614 Poznań, Poland*

We study molecular structure of the subgap bound states in double quantum dots proximitized to superconductor, focussing on a competition between the correlation effects (induced by Coulomb repulsion) and electron pairing. Specifically, we analyze dynamical changover of the bound states parity in response to the quantum quench. Under stationary conditions we determine the tunneling conductance and thermoelectric properties, considering the quantum dots embedded in two- and three-terminal geometries. Finally, we also address the interdot equal spin pairing, which could enable realization of the Majorana modes.

This study is supported by the National Science Centre (Poland) through the grant No. 2022/04/Y/ST3/00061