Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Competition between Kondo and Josephson effects in a triangular triple quantum dot connected to normal and superconducting leads[1]
AKIRA OGURI, MASAYA SHIROTANI, YUKIHIRO NAKATA, YOSHIMICHI TERATANI, Osaka City University, YOICHI TANAKA, Advanced Simulation Technology Of Mechanics R&D, Co., Ltd. — We study low-energy properties of a triangle triple quantum dot (TTQD) connected to one normal and two superconducting (SC) leads, using the Wilson numerical renormalization group approach. This system has various types of quantum phases in the normal state such as the SU(4) and the $S = 1$ Nagaoka-high-spin Kondo effects, depending on the electron filling [1]. The ground state evolves as additional SC leads are connected, and interesting competition between the Kondo and Cooper-pairing singlets occurs [2]. It also causes the Andreev scattering which takes place at the interface between the TTQD and normal lead. We examine how the Andreev scattering affects the quantum phase transition, in a wide range of the gate voltage ϵ_d. Near half-filling, the Josephson phase ϕ between the two SC leads lifts an orbital degeneracy of the TTQD in a different way at $\phi \simeq 0$ and π. We also discuss the conduction-electron under-screening of the local Nagaoka high-spin state. [1] T. Numata, Y. Nisikawa, A. Oguri, and A. C. Hewson, PRB **80**, 155330 (2009). [2] A. Oguri, I. Sato, M. Shimamoto, and Yoichi Tanaka, J. Phys.: Conf. Ser. **592**, 012143 (2015).

[1]This work was supported by JSPS KAKENHI Grant Numbers JP26400319 and JP26220711.

Akira Oguri
Osaka City University

Date submitted: 13 Apr 2017 Electronic form version 1.4