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Quantum Dot Superconducting Quantum Interference Devices with self-assembled InAs RYOSUKE ISHIGURO, Faculty of Science, Tokyo University of Science, SUNMI KIM, MANA, NIMS, EICHIRO WATANABE, DAIJU TSUYA, Nanotechnology Innovation Center, NIMS, KENJI SHIBATA, Institute of Industrial Science, University of Tokyo, KAZUHIKO HIRAKAWA, HIDEAKI TAKAYANAGI, Research Institute for Science and Technology, Tokyo University of Science, JST CREST, MANA, NIMS — We have fabricated quantum-dot superconducting quantum interference devices (QD-SQUID), which have two superconductor / quantum dot /superconductor junctions using superconducting aluminum electrodes with laterally contacting a self-assembled InAs quantum dot. The differential resistance as a function of bias voltage clearly shows multiple Andreev reflection peaks. That indicates a good electric contact is formed at the Al-InAs interface. dV/dI-V at the zero bias voltage is very sensitive to gate voltage and magnetic field, and oscillates with every flux quantum through the SQUID loop. This indicates that the fabricated superconducting loop embedded with two S/QD/S junctions is the coherent state. QD-SQUID will be used for the study of the phase correlation with a Kondo singlet state and the superconductor.

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