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Reduced Kondo conductance in a quantum dot by a high-biased quantum point contact nearby KENICHI HITACHI, Department of Physics, University of Tokyo, AKIRA OIWA, SEIGO TARUCHA, Department of Applied physics, University of Tokyo — A quantum point contact (QPC) near a quantum dot (QD) can be used for detecting the charge state in a QD. Also a single spin in a QD can be monitored by pulsed gate operation. However it has been shown that applied QPC source-drain bias voltage induces undesirable charge and spin fluctuations in a QD, such as photon-assisted like tunneling in a Coulomb blockade regime or suppressing conductance at spin-half Kondo valley. In this experiment, we examined the influence of Kondo valley and inelastic cotunneling at Coulomb valley in detail. We found that decreasing conductance at Kondo valley can be explained by the increase of local temperature, which is estimated by the conductance at inelastic cotunneling. We predict that this local increase of temperature is caused by the back-action between a QD and a QPC. This gives an alternative explanation of suppressing conductance at Kondo valley, which was thought to be the effect of dephasing a spin singlet between the dot and the lead.

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