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Spin-polarized current generation in multiterminal quantum dot in Kondo regime MIKIO ETO, TOMOHIRO YOKOYAMA, Keio University — We theoretically study the generation of spin-polarized current in a quantum dot with strong spin-orbit interaction, such as InAs quantum dot. As a minimal model, we consider two energy levels in a quantum dot, which is connected to N leads through tunnel barriers. When an unpolarized current is injected from a lead, spin-polarized currents are ejected to other leads in the case of $N \geq 3$. First, we show that the spin polarization of the output currents is markedly enhanced by resonant tunneling, around current peaks of Coulomb oscillation, when the level spacing in the dot is smaller than the level broadening. Next, we examine the many-body resonance induced by the Kondo effect in the Coulomb blockade regime. A large spin current is created in the presence of the SU(4) Kondo effect when the level spacing is less than the Kondo temperature.¹

¹M. Eto and T. Yokoyama, J. Phys. Soc. Jpn., in press; arXiv:1010.5956.

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