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Possibility of the Quantum Phase Transition in Non-Superconducting Ni-Substituted $La_{2-x}Sr_xCu_{1-y}Ni_yO_4$ KENSUKE SUZUKI, YOICHI TANABE, TADASHI ADACHI, YOJI KOIKE, Department of Applied Physics, Tohoku University, TAKAYUKI KAWAMATA, RISDIANA RISDIANA, TAKAO SUZUKI, ISAO WATANABE, Advanced Meson Science Laboratory, RIKEN Nishina Center — The possible quantum phase transition has been investigated in non- superconducting Ni-substituted $La_{2-x}Sr_xCu_{1-y}Ni_yO_4$, in which the superconductivity observed in $La_{2-x}Sr_xCuO_4$ is suppressed by the Ni substitution without disturbing the magnetic state in the CuO_2 plane, from the specific heat, muon spin relaxation, electrical resistivity, magnetic susceptibility [1]. It has been concluded that the ground state changes upon hole doping from a magnetically ordered state with strong binding of a hole by Ni in the underdoped regime to a metallic state with the Kondo effect and that the quantum phase transition between two states is modified to be crossover-like due to the phase separation. [1] Y. Tanabe et al., arXiv: 0911.1016.

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