Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Kondo Transport at Low Temperature and Electron-electron Interaction in Dilute Mn-doping $Na_{0.7}CoO_2$ Systems JINCANG ZHANG, ZAIQING ZHANG, YAN XU, CHAO JING, SHIXUN CAO, Shanghai University, DEPARTMENT OF PHYSICS, SHANGHAI UNIVERSITY TEAM — The layer transition-metal oxide $Na_\gamma CoO_2$ engendered much interest to physicists due to its promising thermoelectric properties. Its anomalous large thermoelectric power and low electrical resistivity in combination with low thermal conductivity is difficult to be understood in the framework of conventional band picture. In this paper, we present the results of low-temperature transport behaviour and its dependence on applied magnetic field for dilute Mn doping $Na_{0.7}Co_{1-x}Mn_xO_2$ systems with x=0, 0.03, 0.07, 0.1. The results show that the transport properties are very sensitive to Mn doping and a novel resistivity minimum was found with a characteristic of metallic-semiconductor transition at low temperature for all the doping samples. And the best fitting was made in the framework of Kondo scattering and the electron-electron (e-e) interaction in a wide temperature range of 2-100 K. The weak dependent on the external field prove that the present $Na_{0.7}Co_{1-x}Mn_x$ is a strong disorder system and there exists an enhancing e-e interaction, which reflects a typical characteristic of strong correlation systems. The results prove that the layer $Na_\gamma CoO_2$ is a kind of typical Kondo-like oxide as like the dilute convention alloys.

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Date submitted: 07 Nov 2005 Electronic form version 1.4