

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**“Pudding mold”-type band dispersion as the origin of large thermopower in  $\text{Na}_x\text{CoO}_2$**  KAZUHIKO KUROKI, Dept. App. Phys.+Chem, Univ. Electro-Commun., RYOTARO ARITA, Cond. Mat. Theory Lab., RIKEN —  $\text{Na}_x\text{CoO}_2$  is an interesting material in that it has large thermopower, non-trivial magnetic property, and becomes superconducting when water molecules are intercalated. Recently, in Ref. 1 and 2, we proposed that the magnetism and the superconductivity can have the same root. Namely they can originate from the peculiar band dispersion of  $a_{1g}$  band. In this study, by using Boltzmann’s equation, we calculated the thermopwer of this system. We found that the origin of the coexistence of the large thermopower and the low resistivity in this material is that not just the density of states, the effective mass, nor the band width, but indeed again the peculiar “pudding mold”-type band dispersion of the  $a_{1g}$  band which consists of a dispersive portion below the Fermi level and a dispersionless portion above the Fermi level[3].

[1] K. Kuroki et al., Phys. Rev. B 73, 184503 (2006).

[2] K. Kuroki et al., Phys. Rev. Lett. 98, 13601 (2007).

[3] K. Kuroki and R. Arita, J. Phys. Soc. Jpn. 76 (2007) 083707

Ryotaro Arita  
Cond. Mat. Theory Lab., RIKEN

Date submitted: 25 Nov 2007

Electronic form version 1.4