Abstract for an Invited Paper
for the MAR08 Meeting of
The American Physical Society

NMR studies of Na$_x$CoO$_2$\(^1\)
TAKASHI IMAI, McMaster University

Sodium cobaltate Na$_x$CoO$_2$ is the parent phase of triangular-lattice superconductor Na$_{1/3}$CoO$_2$-[H$_2$O]$_{4/3}$. Co ions take a mixed-valence state of $+4-x$ in this system. Since Co$^{4+}$ and Co$^{3+}$ possess spin S=1/2 and S=0, respectively, one may view the CoO$_2$ layers as charge doped S=1/2 triangular-lattice. CoO$_2$ layers exhibit a rich variety of strongly correlated electron behavior as a function of sodium concentration x, ranging from itinerant antiferromagnet (x$\sim$0.84 and 0.5), “Curie-Weiss metal” (x$\sim$0.71) to Fermi liquid (x$\sim$1/3). In this talk, I will discuss our NMR studies of Na$_x$CoO$_2$ for various Na concentration x, with particular emphasis on $^{59}$Co evidence for charge ordering in the insulating ground state of Na$_{0.5}$CoO$_2$ [1-4].


\(^1\)This work was carried out in collaboration with F.L. Ning, S. Golin, K. Ahilan (McMaster), F.C. Chou, M.-W. Chu, G.J. Shu, F.T. Huang, Woei Wu Pai, H.S. Sheu (National Taiwan University) and P.A. Lee (M.I.T.).