Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Superconductivity in $(TMTSF)_2ClO_4$ probed by ^{77}Se NMR J. SHINAGAWA, UCLA, Y. KUROSAKI, University of Tokyo, S. E. BROWN, UCLA, D. JEROME, Universite de Paris, Sud, J. B. CHRISTENSEN, K. BECHGAARD, Orsted Institute, Copenhagen — Superconductivity in the Bechgaard salts $(TMTSF)_2X$, with X=PF_6, ClO_4, survives well beyond the paramagnetic limit set by the transition temperature $T_c \approx$1K. As a result, it has been hypothesized that the spin pairing is triplet. We report on measurements of the ^{77}Se Knight shift and spin-lattice relaxation rate T_1^{-1}, conducted *in situ* with interlayer resistivity, deep within the superconducting state of $(TMTSF)_2ClO_4$. At fields $H_0 \approx$10kOe aligned along the $\mathbf{a}-$ and $\mathbf{b}'-$axes, the Knight shift reveals a decrease in spin susceptibility χ_s that is likely consistent with singlet pairing. The field dependence of T_1^{-1} at temperatures $T \ll T_c$ exhibits a very sharply-defined increase at a field $H_s \approx$15kOe. For $H_0 > H_s$, T_1^{-1} is close to the normal state value, even though $H_{c2} \gg H_s$ and $R_{zz} = 0$ to within experimental uncertainty. We discuss the implications for interpreting the results as evidence for a crossover, or a phase transition within the superconducting state.

Stuart Brown
UCLA

Date submitted: 01 Dec 2006 Electronic form version 1.4