(PD2)

NMR study on $LaFe_4P_{12}$ in the superconducting state

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In order to clarify the superconducting properties, we have performed ^{139}La,^{31}P-NMR studies on filled skutterudite superconductor $LaFe_4P_{12}$ with a critical temperature $T_c = 4.1$K. Below T_c, although absence of the coherenece peak was observed in T_1 at both La and P sites in 4300G, we observed a distinct coherence peak just below T_c in smaller fields of 950G and 1500G as shown in Fig.1. The coherence peak is found to be easily suppressed by the applied field. An exponential decrease of $1/T_1$ was observed, suggestive of the isotropic superconducting gap with $2\Delta/k_{\rm B}T_c = 3.8$. Besides,we observed the decrease of the Knight shift, indicative of the singlet-pair formation below T_c. These results are clear evidence that $LaFe_4P_{12}$ is a conventional $s-$ wave superconductor. In the poster presentation, we will also show the preliminary data of $LaOs_4Sb_{12}$ in the normal state studied by ^{139}La-NMR which indicates the existence of active phonon relaxation in this compound.

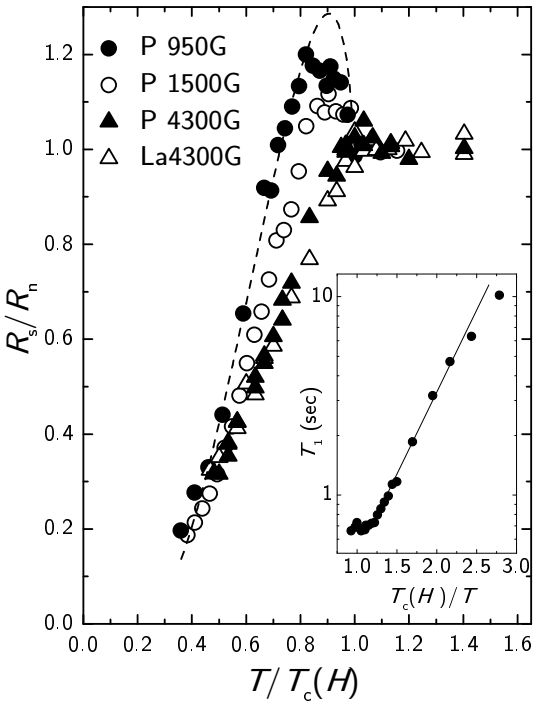

Figure 1: R_s/R_n vs $T/T_c(H)$ under various magnetic fields.The dotted curve is a fit to the theory of Hebel and Slichter with a broadened density of states. Inset : Semilogarithmic plot of T_1 vs $T_c(H)/T$. The solid line represents the relation $T_1 \propto \exp\left(\frac{\Delta(0)}{k_{\rm B}T}\right)$ with $2\Delta(0)/k_{\rm B}T_c = 3.8$.