Unconventional Superconducting states in $Li_2(Pd_{1-x}Pt_x)_3B$ with broken inversion symmetry probed by NMR

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We report NMR study on $Li_2(Pd_{1-x}Pt_x)_3B$ without inversion symmetry in the crystal structure. A mixed state of Cooper pairings (spin singlet and spin triplet state) is expected to emerge due to the lack of inversion symmetry. There are experimental reports that the spin triplet pairing dominates in Li_2Pt_3B, in contrast to Li_2Pd_3B with the spin singlet pairing[1,2] It is considered that the different superconducting properties are due to spin-orbit coupling (SOC) enhanced by the lack of inversion symmetry. To investigate the evolution of the pairing symmetry in $Li_2(Pd_{1-x}Pt_x)_3B$, we measured down to 0.1K ^{195}Pt Knight shift which is the most effective probe to judge the spin states, as well as spin lattice relaxation rate ($1/T_1$) of ^{11}B and ^{195}Pt. We found a dramatic transition from the spin singlet sate to the spin triplet state as x is increased
We will discuss the relations between the unconventional pairing and the strength of SOC.

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