

Magnetic properties in Sr_2RuO_4

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The superconductivity in Sr_2RuO_4 is considered to be p-wave spin-triplet pairing. However, the Knight shift in the NMR experiment does not decrease in any directions below the superconducting transition temperature (T_c). This indicates that the orientational energy of the order parameter field is less than energy corresponding to the applied magnetic field (200G). We need to investigate how we can obtain such small anisotropy energy. Here, on the basis of the perturbation theory, we determine the d-vector in the spin-triplet pairing on the multi-band Hubbard model with the spin-orbit interaction. Then, we discuss the anisotropy energy.

In addition, we investigate curious anisotropic behaviors of $1/T_1$ in the NQR experiment, which indicates temperature dependence of the in-plane susceptibility is different from that of out-of-plane below T_c . Thus, on understanding the superconductivity in Sr_2RuO_4 , it is very important to clarify the magnetic properties.

We here investigate the magnetic properties in the normal and superconducting states in Sr_2RuO_4 , considering the spin-orbit interaction. Then, we discuss the anisotropic behavior of $1/T_1$, and the magnetic susceptibility.