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Spin state of Mn_3O_4 investigated by ^{55}Mn NMR EUNA JO, KYONGMO AN, JEONGHYUN SHIM[1], CHANGSOO KIM, SOONCHIL LEE, Department of physics, KAIST, Daejeon 305-701, Korea, KAIST TEAM — The ^{55}Mn nuclear magnetic resonance spectrum for spinel oxide Mn_3O_4 was measured in the temperature range of 6 K - 30 K to investigate the spin structure in the ground state. The spectrum consists of three peaks in the frequency range of 250 - 265 MHz, which corresponds to the hyperfine field range of 24 - 25 T. The temperature dependence of the spectrum and the rf enhancement factor show that Mn^{3+} ions have two different magnetic moments, one of which is strongly related with the commensurate-incommensurate phase transition. This is consistent with the picture of two magnetic moments, R and S, claimed from the result of a neutron experiment. The dipolar hyperfine field was calculated to explain the splitting of two peaks coming from R and S and to estimate the magnetic moments. The spin-spin relaxation time has a frequency dependence that induces spectrum broadening and further splitting of the peak coming from S, indicating that the Suhl-Nakamura interaction is the major relaxation mechanism in Mn_3O_4.

[1]current address : Fakultät Physik, Technische Universität Dortmund, Dortmund, Germany

Euna Jo
Department of physics, KAIST, Daejeon 305-701, Korea

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