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^{11}B NMR Study of Spin Structure and Dynamics in TbB_4 Single Crystal S.K. KWON, B.J. MEAN, S.K. NAM, S.H. CHOI, H.H. CHOI, MOOHEE LEE, Konkuk University, Seoul 143-701 Korea, B.K. CHO, GIST, Gwangju 500-712, Korea — ^{11}B NMR measurements have been performed on the single crystal of TbB_4 to investigate $4f$spin structure and dynamics. ^{11}B NMR spectrum, shift, $1/T_1$ and $1/T_2$ are measured down to 5 K at 8 T perpendicular to the (110) plane. ^{11}B NMR shift and linewidth are huge and strongly temperature-dependent due to the $4f$ moments of Tb. In addition, both are proportional to the magnetic susceptibility, indicating that the hyperfine field at the boron site originates from the $4f$ spins of Tb. Below $T_N = 43$ K, the single broad resonance peak of ^{11}B NMR splits into several peaks reflecting the onset of internal magnetic fields due to the antiferromagnetic spin arrangements. Assuming that the $4f$ moments are aligned antiferromagnetically and collinearly in the basal plane perpendicular to the c-axis, we have calculated dipolar fields at the 16 boron nuclear sites from the $4f$ spins of Tb. The results show that the various peaks of ^{11}B NMR spectrum at 5 K are generally consistent with the calculation confirming that the collinear spin arrangement is correct. The longitudinal and the transverse relaxation rates, $1/T_1$ and $1/T_2$, are independent of temperature above T_N and then decreases tremendously indicating the huge suppression of spin fluctuations below T_N.

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