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¹¹B NMR Study of Spin Structure and Dynamics in TbB₄ 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 — ¹¹B NMR measurements have been performed on the single crystal of TbB₄ to investigate 4fspin structure and dynamics. ¹¹B NMR spectrum, shift, $1/T_1$ and $1/T_2$ are measured down to 5 K at 8 T perpendicular to the (110) plane. ¹¹B 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 $T_N = 43 \text{ K}$, the single broad resonance peak of ¹¹B 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 ¹¹B 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 .

> Moohee Lee Konkuk University, Seoul 143-701 Korea

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