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^{31}P NMR studies of an optimally doped superconductor $Ba_{0.5}Sr_{0.5}Fe_2(As_{1-x}P_x)_2$ (x~0.4)

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We report ^{31}P NMR studies of an oriented polycrystalline superconductor of $Ba_{0.5}Sr_{0.5}Fe_2(As_{0.6}P_{0.4})_2$ (T_c = 29 K). The P-substituted $Ba_{0.5}Sr_{0.5}Fe_2As_2$ is one of the high-T_c superconductors as well as $BaFe_2As_2$and $SrFe_2As_2$ [1]. The ^{31}P nuclear spin-lattice relaxation rate $1/T_1$ shows an asymptotic behavior of $a+bT$ (a and b are constants) at higher temperatures than about 100 K and the minimum at 40 K with an upturn toward T_c. The a term in $1/T_1$ indicates the presence of two dimensional antiferromagnetic spin fluctuations. The negative Weiss temperature Θ = –15 K of the Curie-Weiss-type antiferromagnetic spin susceptibility $\chi(Q) \propto 1/(T+\Theta)$ in the analysis of $1/T_1T$ suggests a weakly antiferromagnetic ground state in the suppression of superconductivity. No spin pseudogap characterizes the weakly antiferromagnetic spin fluctuations above T_c.
[1] S. Adachi, Y. Murai, and K. Tanabe: Physica C **483**, 67 (2012).

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