Alignment Correlation Terms In β-Ray Angular Distributions From Spin Aligned ^{20}F And ^{20}Na

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The alignment correlation term in the β ray-angular distribution is one of the good probes to search for the induced tensor term g_{II} in the axial vector current in the weak interaction. The induced tensor term g_{II} causes the breaking of the *G*-symmetry that is well conserved in the strong interaction. From the difference between the alignment terms of the mirror nuclei, the induced tensor term is obtained as the ratio, g_{II}/g_A, where g_A is the GT strength. In the present work, the alignment correlation terms of the mirror nuclei in mass number 20 system, ^{20}F and ^{20}Na, have been measured by the spin manipulation technique based on the β-NMR.

The measurements on ^{20}F and ^{20}Na were performed at the Univ. of Tsukuba and TRIUMF, respectively. Polarized ^{20}F(^{20}Na), which were produced by the ^{19}F$(d,p)^{20}$F reaction (by the optical pumping method), were implanted into the MgF$_2$ (Mg) catcher. With the spin manipulation technique, the polarization was converted to the pure alignment, and then we observed the angular distribution of the β rays emitted from the aligned nuclei. The obtained alignment correlation terms $\alpha(E)$ of ^{20}F and ^{20}Na are shown in Fig.1. From the $\alpha(E)$ of ^{20}F and ^{20}Na, we will discuss the limit of the *G*-parity symmetry.
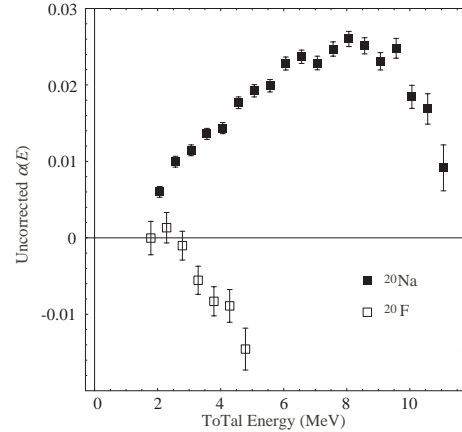
FIGURE 1. Obtained alignment correlation terms of ^{20}F and ^{20}Na as a function of the β-ray total energy.