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Hamiltonian of combined hyperfine interactions and its influence on the gamma-gamma angular correlations

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This work presents detailed calculations of the Hamiltonian describing the combined magnetic dipole and non-axially symmetric electric quadrupole interactions. The resulting eigenvalues and eigenvectors are incorporated into the perturbation factor G22(t) for a polycrystalline sample, as defined by time-differential perturbed angular correlation (TDPAC) theory. G22(t) spectra for the combined hyperfine interactions are generated, and some representative experimental TDPAC spectra measured for BiFeO3 are introduced to demonstrate the relevance and applicability of the theoretical model.

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