We propose a new mechanism to induce a novel one-magnon excitation by the electric component of light in spins with noncollinear structures, where electric fields couple to spins through the symmetric spin-dependent electric polarizations $P_S = \Pi_{ij}(S_i \cdot S_j)$ \cite{1,2}.

One of the typical examples for noncollinear structures is a cycloidal spin structure, which is realized due to the frustration between nearest neighbor $J_1$ and next nearest neighbor interactions $J_2$ in classical spin systems. We adopt the mechanism to the three-dimensional frustrated Heisenberg systems (Fig.1), where cycloidal spin states are the ground state in highly frustrated parameter region, and show that the electromagnon at zone-edge can be induced by oscillating electric fields $E_\omega \parallel a$. Such a zone-edge magnon excitation corresponds to the absorption observed in multiferroic perovskite manganites $RMnO_3$ \cite{2-8} and the selection rule, i.e., the strong absorption is observed only for the condition $E_\omega \parallel a$, is also consistent with experimental observations. Some parts of optical spectra observed experimentally in DyMnO$_3$ \cite{5} and TbMnO$_3$ \cite{7} can be explained well as shown in the figures (Fig.2 for DyMnO$_3$ and Fig.3 for TbMnO$_3$).

Noncollinear structures can be realized due to the frustration generally and, thus, the absorption due to the electromagnon process likely exists in various frustrated materials.

\cite{1} S. Miyahara and N. Furukawa, arXiv:0811.4082