

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**“Lorentz force” acting on a ray of light in multiferroics** KEI SAWADA, NAOTO NAGAOSA, CREST, Department of Applied Physics, the University of Tokyo — We theoretically propose that optical analogue of a Lorentz force acting on a ray of light is realized in multiferroic materials showing an optical magneto-electric effect. The toroidal moment  $\vec{T} = \sum_j \vec{r}_j \times \vec{S}_j$  plays a role of “vector potential” while its rotation corresponds to a “magnetic field” for photons. Hence the light is subject to the Lorentz force when propagating through the domain wall region of the ferromagnetic or ferroelectric order. Realistic estimate on the magnitude of this effect is given.

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Date submitted: 21 Nov 2005

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