

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Theory of electromagnons in CuO KUN CAO, FELICIANO GIUSTINO, Department of Materials, University of Oxford, PAOLO RADAELLI, Clarendon Laboratory, Department of Physics, University of Oxford — Recently, an electromagnon excitation was found in the multiferroic phase of CuO for electric field parallel to the [101] direction, with excitation energy ~ 3 meV. We performed symmetry analysis to show that the experimentally measured electromagnon cannot be explained by the exchange-striction mechanism. We then studied the CuO electromagnons using ab-initio calculations and effective model simulations. The experimentally measured electromagnon was found to originate from the Dzyaloshinskii-Moriya interaction, with the magnon part corresponding to a phason mode. We further predict that a new high-energy electromagnon with selection rule $E \parallel [010]$ should also exist in the multiferroic phase of CuO, due to the exchange-striction mechanism.

Kun Cao
Department of Materials, University of Oxford

Date submitted: 13 Nov 2014

Electronic form version 1.4