Abstract Submitted
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**Pressure- and field-dependent Raman studies of magnetodielectric behavior in $Mn_3O_4$**[1] M. KIM, S. YUAN, S.L. COOPER, Department of Physics and Frederick Seitz Materials Research Laboratory, University of Illinois, Urbana, Illinois, 61801 — We present simultaneous pressure- and field-dependent Raman scattering studies of the magnetodielectric spinel, $Mn_3O_4$, which allow us to investigate both the microscopic origins and pressure dependence of magnetodielectric phenomena in this material. We identify the specific phonon modes responsible for the dramatic magnetodielectric behavior observed in this material, and show that these modes provide quantitative information regarding magnetodielectric behavior in $Mn_3O_4$ via the Lyddane-Sachs-Teller (LST) relationship. We also show that pressure can induce monoclinic distortions accompanied with magnetic ordering in $Mn_3O_4$. Finally, by exploring the field-dependent phonon spectrum at different pressures, we are able to map out the pressure-field structural phase diagram of $Mn_3O_4$ and explore the pressure-dependence of magnetodielectric behavior in this material.

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