High-Energy Magneto-Dielectric Effect in Co$_3$V$_2$O$_8$.\textsuperscript{1} L. I. VERGARA, R. C. RAI, J. CAO, S. BROWN, J. L. MUSFELDT, University of Tennessee, D. J. SINGH, Oak Ridge National Laboratory, G. LAWES, Wayne State University, N. ROGADO, DuPont Central Research and Development, R. J. CAVA, Princeton University, X. WEI, Florida State University — We investigate the optical and magneto-optical properties of the Kagomé staircase compound Co$_3$V$_2$O$_8$ in order to explore mechanistic aspects of the high-energy magneto-dielectric effect. Co$_3$V$_2$O$_8$ displays a much smaller dielectric contrast compared to quasi-isostructural Ni$_3$V$_2$O$_8$, a result that we attribute to a high-temperature local structural distortion in Co$_3$V$_2$O$_8$ along the cross-tie direction. Such a distortion prevents the low temperature magnetic transitions from having a strongly coupled lattice component. This proposition is supported by vibrational studies.

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