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Spin-Phonon coupling in frustrated magnet $CdCr_2O_4$[1] ROLANDO VALDES AGUILAR, A.B. SUSHKOV, H.D. DREW, MRSEC, University of Maryland. College Park, MD 20742, Y-J. CHOI, S-W. CHEONG, Rutgers University, Piscataway, NJ 08854 — Strongly frustrated magnetic materials resist magnetic ordering down to very low temperatures. The existence of order in some of these systems involves the occurrence of a spin-driven lattice distortion. The Cr spinels, with non-Janh-Teller active ions, are excellent examples of such frustrated systems where magneto-elastic coupling causes the ordering of the spins. The distinct distortions in these Cr spinels couple to different spin orders. This is the case in $ZnCr_2O_4$ and $CdCr_2O_4$, where the unit cell contracts and elongates along the c axis, respectively. The contraction in $ZnCr_2O_4$ splits a triply degenerate infrared (IR) active phonon[2]. The magnitude of the splitting and the redistribution of spectral weight gives a sensitive measure of the spin correlations in this system. We report the temperature dependence of the IR active phonons in $CdCr_2O_4$. The phonon splitting is similar to $ZnCr_2O_4$, but with opposite spectral weight distribution. We discuss these effects in light of recent theoretical models[3].

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[2]A.B. Sushkov, et al. PRL **94** 137202 (2005)
[3]G-W.Chern, et al. PRB **74** 060405 (2006)

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