

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Characterization of molecular crystal phonons ROHIT SINGH, DEEPU GEORGE, ANDREA MARKELZ, Physics Dept., SUNY Buffalo — The terahertz frequency vibrational modes of molecular crystals can be used to determine polymorphism in pharmaceuticals and fundamental coupling between intramolecular and intermolecular motions [1]. As the molecular complexity increases, assignment of these modes becomes problematic with inhomogeneous broadening and increasing density of modes. Recently inhomogeneous broadening has been overcome by forming crystalline films on the surface of waveguides[2], however the inherent mode overlap for large systems is still problematic as the films formed are poly crystalline. Here we achieve mode separation by using single crystals and rapid modulation of the relative alignment of the terahertz polarization and the crystal axes by rotating the sample. The signal at the rotation frequency allows the rapid mapping out the optically active vibrational resonances along the different molecular and crystal orientations. 1. C.J. Strachan, P.F. Taday, D.A. Newnham, K.C. Gordon, J.A. Zeitler, M. Pepper, and T. Rades, *J. Pharm. Sci.*, 2005. 94: p. 837-846. 2. J.S. Melinger, N. Laman, S.S. Harsha, S. Cheng, and D. Grischkowsky, *J. Phys. Chem. A*, 2007. 111: p. 10977-10987.

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Date submitted: 28 Nov 2009

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