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Magnetic-Field Dependent IR Active Modes in CrOCl LI-CHUN TUNG, University of North Dakota, HAIDONG ZHOU, University of Tennessee, ZHIGANG JIANG, Georgia Institute of Technology, ZHIQIANG LI, DMITRY SMIRNOV, National High Magnetic Field Laboratory — CrOCl is a magnetoelastic material in which a correlation between an antiferromagnetic transition at 13.5K and a lattice structural distortion was discovered in the absence of the magnetic field. An applied magnetic field is known to induce a spin-flip transition at around 4T, while a correlation between this magnetic transition and the lattice order has not been observed. Greenish leaves-like CrOCl crystals are carefully laid upon the Scotch tape to create a film-like sample for IR transmittance and reflectance measurements at 4K in the magnetic field as high as 35T. Several sharp optical absorptions have been observed and they can be attributed to the IR-active phonon modes in CrOCl lattice. Among them, several modes exhibit a strong correlation to the spin-flip transition, implying a magnetic-field induced structural transition. Moreover, evolution of these modes agrees with the magnetic hysteresis of the spin-flip transition. Implications of the strong magnetoelastic coupling in CrOCl will be discussed in the presentation.

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