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Observation of interlayer phonon modes in few-layer CrI3¹ FABIAN DIAZ, SAAD SIDDIQ, ERIC WAUER, ZHIPENG YE, POUYAN REZAIE, RUI HE, Texas Tech University, DAHLIA KLEIN, DAVID MACNEILL, MIT, C.H. LUI, UC Riverside — Chromium triiodide (CrI3) is an Ising ferromagnet with van der Waals interlayer coupling. Atomic layers of CrI3 have been demonstrated to display 2D ferromagnetism which makes them potential candidates for data storage applications. We used ultralow frequency Raman spectroscopy to probe the interlayer coupling in CrI3 atomic layers produced by mechanical exfoliation. We observed the lowest-frequency branch of layer breathing mode (LBM) vibration in the atomic layers. The LBM redshifts dramatically with increasing number of layers, similar to that seen in few-layer graphene. The shear modes are not observed in CrI3 atomic layers. The LBM frequency does not show a strong temperature dependence. Our studies offer the first direction observation of interlayer phonons in CrI3.

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