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Dynamics of the Ho^{+3} magnetism in the multiferroic compound h- HoMnO_3 investigated via time domain terahertz spectroscopy N.P. ARMITAGE, NICHOLAS LAURITA, The Johns Hopkins University, RONGWEI HU, MEIXIA WU, SEONGSHIK OH, Rutgers University — The hexagonal rare-earth manganites REMnO_3 display a diverse array of magnetism as many contain both magnetically active rare-earth and Mn moments. Of this class h- HoMnO_3 (HMO) is of particular interest as Ho ions possess the largest rare-earth magnetic moment making HMO a prototype material for studying magnetic exchange in these systems. However, few experiments have been performed on HMO at low temperatures, when both Ho and Mn sublattices are ordered, and therefore little is known regarding the role of Ho moments in the magnetic response. In this work we present a systematic study of the far infra-red spectra of HMO as a function of both temperature and magnetic field. A splitting of the spectra is observed at low temperatures which we attribute to exchange between Ho and Mn moments. The corresponding field dependence is studied and shown to reveal further evidence of exceptional Ho-Mn exchange including a g-factor that is enhanced by a factor of 2 at the Ho ordering transition.

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