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## 【639】 Higgs and Goldstone dynamics in $\text{h-RMnO}_3$

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Making connections between various domains of modern physics is an exciting opportunity. The spontaneous symmetry breaking of the crystal structure of hexagonal manganite creates an almost perfect Mexican hat potential. We have performed polarization resolved Raman spectroscopy of  $\text{ErMnO}_3$  and two types of  $\text{InMnO}_3$ . In  $\text{ErMnO}_3$ , the phonons that have a substantial overlap with the Higgs amplitude mode show an unusually strong red softening on warming. In contrast the frequencies of the corresponding modes in  $\text{InMnO}_3$  are largely temperature-independent. These results are consistent both qualitatively and quantitatively with our combined Landau and ab initio model describing the coupling between the Higgs and the Goldstone-like mode in the hexagonal manganites.

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