

# Spin-phonon coupling in uniaxial anisotropic spin-glass based on $\text{Fe}_2\text{TiO}_5$ pseudobrookite

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The ferric pseudobrookite is a rare example of uniaxial anisotropic spin-glass insulator, depicting a multiglass behaviour and magnetoelectric coupling. Here, we present Raman spectroscopy results in order to elucidate the spin-phonon coupling in  $\text{Fe}_2\text{TiO}_5$  for the first time. The experimental data are supported by computational simulations performed in view of density functional theory, which allowed us to assign the main Raman-active modes. Temperature-dependent phonon behaviour exhibited anomalous evolution around 55 and 80–200 K, which was explained as successive coupling between lattice and spin configuration arising from spin freezing and short-range magnetic correlation, respectively. Arguments that the magnetoelectric effect in  $\text{Fe}_2\text{TiO}_5$  is mediated by spin-phonon coupling are presented.