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Infrared and Raman spectroscopy of the magneto-electric couping in $BiFeO_3$ R.P.S.M. LOBO, R. SCHLECK, CNRS-ESPCI, France, R.L. MOREIRA, Depto. Fisica, UFMG, Brazil, P. ROVILLAIN, M. CAZAYOUS, MPQ, Univ. Paris Diderot, France, D. LEBEUGLE, D. COLSON, SPEC, CEA, Saclay, France
— We measured the phonon spectra of $BiFeO_3$ single crystals utilizing infrared spectroscopy and Raman scattering. The data was taken from 4 K to 300 K using a fine temperature step. Small accidents observed in the temperature dependence of phonon frequencies, in particular the lowest E mode, have corresponding features in the electromagnon response. High temperature data, up to 1200 K, on ceramics (infrared) or single crystals (Raman) also show phonon frequency renormalization at the Néel temperature. Our results reinforce a picture where the ferroelastic character of $BiFeO_3$ plays an important role.

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