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Temperature-dependent optical properties of $CuFeO_2$ through the structural phase transition

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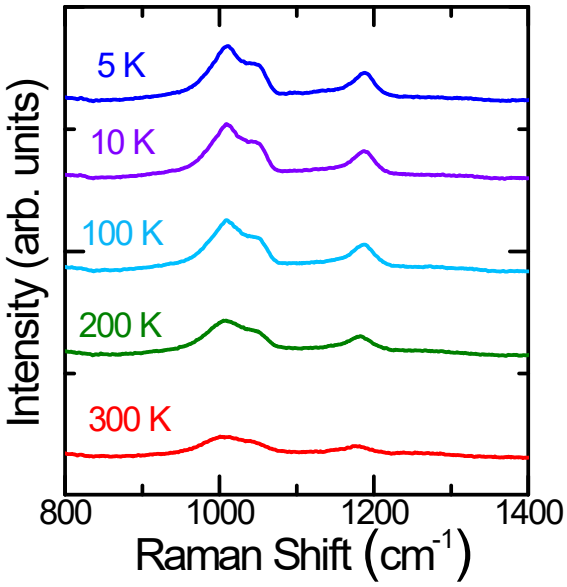

FIG. S1 Temperature-dependent Raman scattering spectra of the multiphonon modes of $CuFeO_2$.

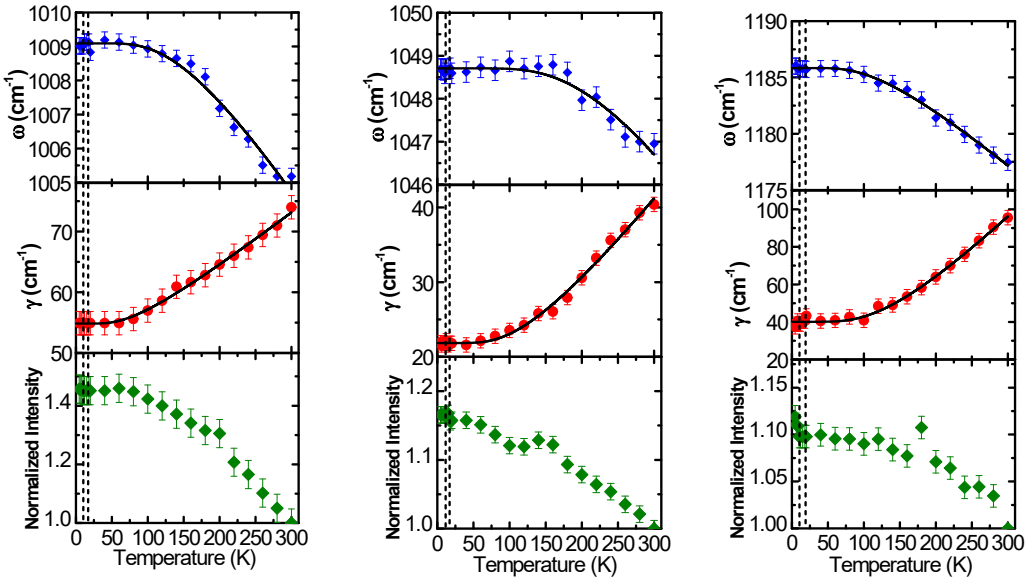

FIG. S2 Temperature-dependent frequency, linewidth, and normalized intensity of the multiphonon modes of $CuFeO_2$. The fitting results of the anharmonic model are represented in the solid lines. The vertical dashed lines denote the phase transition temperatures at 11 and 16 K.

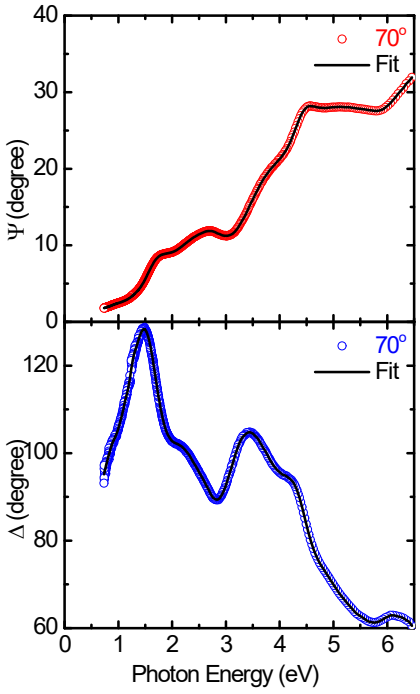

FIG. S3 Room temperature experimental at 70° incident angle and fitting model of ellipsometric variables of Ψ and Δ of $CuFeO_2$.

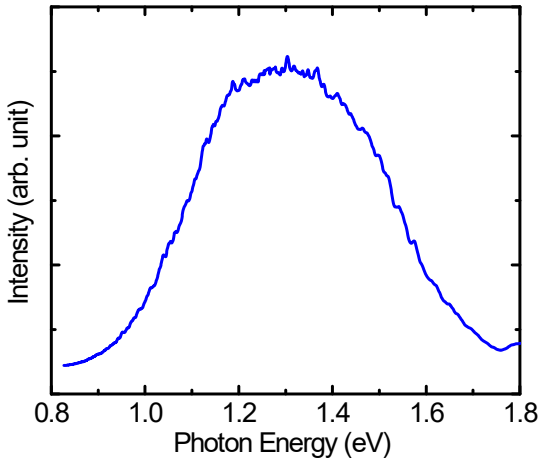

FIG. S4 Room temperature photoluminescence spectrum of $CuFeO_2$.