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Spin relaxation of stress-split orthoexcitons in cuprous oxide* JOON JANG, University of Illinois at Urbana-Champaign, JIM WOLFE, University of Illinois at Urbana-Champaign — By applying Hertzian strain fields of σ = 0 – 1.1 kbar along (100) direction, we break the cubic crystal symmetry of the cuprite, causing the triply-degenerate orthoexciton to split into a singlet and doublet. The interconversion rate between the orthoexciton singlet and lower-lying doublet is measured at temperatures from 2 to 15 K by using sub-nanosecond time-resolved luminescence. Based on the experimentally observed stress and temperature dependence, we propose that this transition process occurs via TA-phonon scattering associated with a shear tensor field, in contrast to the vector field scattering mechanism for the ortho-para conversion. At high excitation levels, both singlet and doublet transients are well explained by a density-dependent Auger recombination process. *Supported by DOE Grant DEFG02-96ER45439

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