Abstract Submitted
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Quantum Relaxation in a Proton Glass C. ANCONA-TORRES, Y. FENG, T. F. ROSENBAUM, S. R. NAGEL, University of Chicago, E. COURTENS, Universit Montpellier II, D. PRICE, University of Orleans, G. REITER, University of Houston — $Rb_{1-x}(NH_4)_xH_2PO_4$ is a dipolar structural glass with spatial frustration from the mixture of ferroelectric RDP and antiferroelectric ADP. We measure the ac dielectric susceptibility of RADP:72 and RADP:35 over 7 decades of frequency for $0.3 < T < 300$ K. The relaxation is quantitatively similar for both concentrations at low temperatures, pointing to a local mechanism. We correlate the dielectric susceptibility with the potential energy landscape derived from neutron Compton scattering experiments and solve for the tunneling parameters of the protons, finding correlated rearrangements of the hydrogen network. By analogy with vortex tunneling in high-Tc superconductors, we relate the logarithmic decay of the polarization to the quantum mechanical action.

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