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Proton Tunneling Relaxation in the Dielectric glass RADP YEJUN FENG, CARLOS E. ANCONA-TORRES, THOMAS F. ROSENBAUM, James Franck Insititute and Dept. of Physics, Univ. of Chicago, ERIC COURTENS, Laboratoire des Verres, Universit Montpellier II — Tunneling plays an important role in glassy relaxation at low temperature, but quantitative modeling of data is rare. We relate the dielectric susceptibility over 7 decades of frequency to the microscopic hydrogen free energy landscape obtained in neutron Compton experiments for the proton glass $Rb_{0.28}(NH4)_{0.72}H_2PO_4$ (RADP:72). RADP is a dipolar structural glass with spatial frustration between local ferroelectric RDP and antiferroelectric ADP ordering. We find a well-defined attempt frequency and a logarithmic relaxation over decades of frequency, with a classical to quantum crossover analogous to the vortex tunneling dynamics in high T_c superconductors.

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