

Abstract Submitted
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Relaxation Dynamics in Glass-Forming Hydrogen-Bonded Liquids H.G.E. HENTSCHEL, Emory University, ITAMAR PROCACCIA, Weizmann Institute of Science — We will address the relaxation dynamics in hydrogen-bonded super-cooled liquids near (but above) the glass transition, measured via Broad-Band Dielectric Spectroscopy (BDS). We propose a theory based on decomposing the relaxation of the macroscopic dipole moment into contributions from hydrogen bonded clusters of molecules. We discuss the statistical mechanics of the super-cooled liquid and with a theoretical estimate of the relaxation time of each cluster we provide predictions for the real and imaginary part of the frequency dependent dielectric response. Using glycerol as a particular example we demonstrate quantitative correspondence between theory and experiments. The theory also demonstrates that the α peak and the “excess wing” stem from the same physics in this material.

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