

Abstract Submitted
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Off-equilibrium fluctuation dissipation relation in polymer glasses¹ HASSAN OUKRIS, NATHAN ISRAELOFF, Dept. of Physics, Northeastern University — Aging dynamics in thin films of polyvinyl acetate (PVAc) is investigated using a rapid quench process by applying local joule heating to a thin layer capacitor. We study the validity of fluctuation dissipation relation (FDR) during aging in a glassy polymer. The time evolution of noise and dielectric susceptibility is analyzed in the frequency range 0.1 Hz- 10^3 Hz following quenches to below and near the glass transition temperature (T_g). It is found that eliminating extraneous noise spikes due to differential thermal contraction is important for accurately determining effective temperature. We find a large violation of FDR which extends to $ft_w=300$, much larger than for spin glasses. The results of these studies are important in understanding the relaxation dynamics of structural glasses and in testing the validity and relevance of the effective temperature concepts. Experimental study of FDR in aging systems can give new insight into the interpretation of the aging dynamics.

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