

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Experimental test of Generalized Fluctuation Dissipation Theorems during a transient**<sup>1</sup> SERGIO CILIBERTO, ISAAC THEURKAUFF, ARTYOM PETROSYAN, ENSL-CNRS — In recent years the study of the Fluctuation Dissipation Theorem (FDT) in out of equilibrium system have received a lot of attention both theoretically and experimentally. Several Generalized FDT (GFDT) have been proposed but many theoretical results concern the steady state regimes and only a few the transient regimes. We report here an experiment in which two formulations of GFDT have been tested during the relaxation dynamics of a liquid crystal quenched near the critical point of Fréedericksz transition, which is similar to a second order phase transition and it presents a critical slowing down. Thus the relaxation dynamics after the quench is sufficiently slow to perform several measurements. During the relaxation, the equilibrium FDT is strongly violated and this allows us to test the two GFDT. One is based on a transient fluctuation theorem and the time dependent distribution function. The other is a generalization of the Hatano-Sasa relations for transient state and has the very clear interpretation that the violation of the equilibrium FDT is related to the heat fluxes. The advantages and draw back of the two GFDT are discussed from an experimental point of view.

<sup>1</sup>ERC-OuteflucoP

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Date submitted: 14 Nov 2014

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