Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Quantum Quench Dynamics in the Transverse Field Ising Model at Non-zero Temperatures[1] NILS ABELING, STEFAN KEHREIN, Univ Goettingen — The recently discovered *Dynamical Phase Transition* denotes non-analytic behavior in the real time evolution of quantum systems in the thermodynamic limit and has been shown to occur in different systems at zero temperature [Heyl *et al.*, Phys. Rev. Lett. **110**, 135704 (2013)]. In this talk we present the extension of the analysis to non-zero temperature by studying a generalized form of the Loschmidt echo, the work distribution function, of a quantum quench in the transverse field Ising model. Although the quantitative behavior at non-zero temperatures still displays features derived from the zero temperature non-analyticities, it is shown that in this model dynamical phase transitions do not exist if $T > 0$. This is a consequence of the system being initialized in a thermal state. Moreover, we elucidate how the Tasaki-Crooks-Jarzynski relation can be exploited as a symmetry relation for a global quench or to obtain the change of the equilibrium free energy density.

[1]This work was supported through CRC SFB 1073 (Project B03) of the Deutsche Forschungsgemeinschaft (DFG).

Nils Abeling
Univ Goettingen

Date submitted: 06 Nov 2015 Electronic form version 1.4