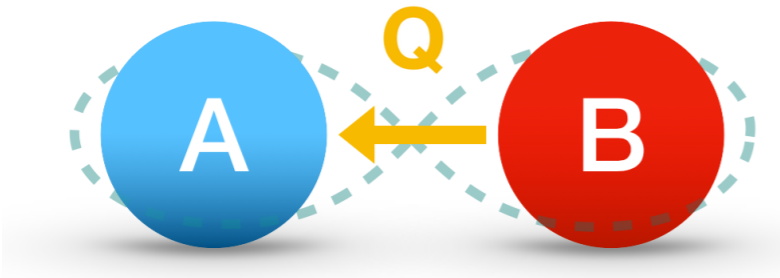


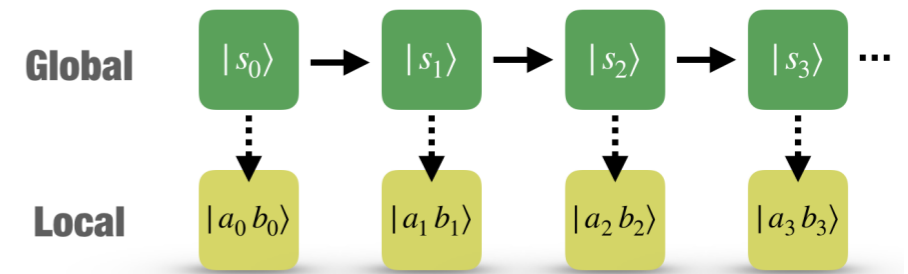
QUANTUM FLUCTUATION THEOREMS WITH BAYESIAN NETWORKS

Eric Lutz, University of Stuttgart (and many collaborators): PRL 127, 180603 (2021) and PRL 124, 090602 (2020).

- Fluctuation relation for heat transfer in bipartite system:



- Dynamic Bayesian network approach:



Usual FT do not account for quantum coherence/correlation (two-point measurement scheme destroys nondiagonal elements)

Local trajectory conditioned on global trajectory (local and global bases noncompatible in general)

$$\frac{\mathcal{P}[\Gamma]}{\mathcal{P}[\Gamma^*]} = \exp(Q_A \Delta\beta + I_0 - I_1 - \Sigma_A - \Sigma_B + \gamma)$$

I_j = stochastic mutual information (initial and end)

Σ_k = stochastic relative entropy (initial and end)

- NMR experiment:

