Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

On Heat in a Quantum Mechanical Process TANAPAT DEESUWAN, Imperial College London/ University College London, JANET ANDERS, University College London — Heat is the portion of energy exchange between systems in thermodynamic process which, unlike work, is always associated with the change of the entropies of the systems. In the context of quantum thermodynamics, heat process is described by an incoherent generalised quantum evolution, which is a map between two quantum states that does not preserve the entropy. Based on an information-theoretic reasoning, we propose that heat involving in a general quantum thermodynamic process can be separated into two types: one that is due to the unital subclass of the evolutions and another one that is due to the others. According to these categories, we show how the former type of heat can be incorporated into Jarzynski equality, resulting in a generalised version of the equality. We also derive a Jarzynski inequality which incorporates all heat into the picture and show that this situation is just equivalent to the presence of Maxwell's demon.

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Date submitted: 25 Jan 2013 Electronic form version 1.4