

## Negentropy Maximization Principle (NMP)

### NMP

1. generalizes the basic rules of quantum measurement theory stating that in quantum measurement the system goes to a eigenstate of measured observables with reduction probabilities given by moduli squared of coefficients of various eigenstates in the superposition
2. relies on the notion of number-theoretic Entanglement Negentropy (NE):
  - (a) The usual definition of entanglement negentropy is based on Shannon formula applying for general entanglement probabilities implies that entanglement negentropy is non-positive.
  - (b) The number theoretic for rational/algebraic entanglement probabilities is based on p-adic norm for some p. In this case probabilities in the arguments of logarithms are replaced by their p-adic norms.
  - (c) p-Adic negentropy can be positive if p is chosen in such a manner that the resulting number theoretic negentropy is maximal. Entanglement carries information.
  - (d) The most restricted form of NE (NE1) is that it applies only to the outcome of state function reduction that is eigenspace of density matrix. so that final state density matrix is nxn density matrix and negentropy corresponds to the largest prime power dividing n. Initial state negentropy would be non-positive.
  - (e) The most general form of NE (NE2) is that also initial state negentropy is number theoretic when entanglement coefficients are rational (or even algebraic).
3. assumes the interpretation of negentropic entanglement as
  - (a) carrier of information about a rule whose instances correspond to state pairs appearing in the superposition (Schrödinger cat serves as a good example)
  - (b) unitary entanglement matrix gives rise to unit density matrix so that quantum computation corresponds to negentropic entanglement, which should be stable against NMP. Does this mean that computation does not halt and outcome must be read by interaction free quantum measurements?
  - (c) One can pose additional conditions such as the condition that EN is same for all decompositions of the system to two parts. This fixes NE highly uniquely.
4. assumes that
  - (a) the density matrix of the system is universal observable: this assumption could be given up for NE1
  - (b) system is reduced to an eigen-space of density matrix.
5. states that negentropy gain defined as increase of entanglement negentropy reduction is maximal and
  - (a) is nontrivial for NE1 only when density matrix has degenerate eigen states
  - (b) for NE2 can in principle allow a situation in which state function does not occur for non-trivial density matrix not equal to identity matrix
6. predicts that negentropic entanglement tends to be generated: Universe gathers information about itself implying evolution as generation of negentropic entanglement leading to generation of "Akashic records" which might be readable by interaction free quantum measurements