Quantum Entropy And Trace Inequalities

Relevant Bibliography

1) Eric Carlen, "Trace Inequalities and Quantum Entropy: An Introductory Course", 73-140 Contemp. Math. 529, Amer. Math. Soc. (2010).

2) Mark Wilde, "Quantum Information Theory", Cambridge University Press.

3) Marco Tomamichel, "Quantum Information Processing with Finite Resources", Springer Briefs in Mathematical Physics.

1. Basic Definitions And Notations

- $\mathcal{M}_n$: Space of $n \times n$ matrices (also referred to as operators on $\mathbb{C}^n$)
- $\langle \cdot, \cdot \rangle$: Inner product on $\mathbb{C}^n$, or other Hilbert spaces $\mathcal{H}$, $\mathcal{K}$, $\mathcal{L}$.

on $\mathbb{C}^n$ is a convex set.

are on $\mathbb{C}^n$,

called pure states.

Remark Observables in quantum mechanical systems in general on infinite-dimensional, separable Hilbert spaces.

Here we restrict to finite-dimensional spaces.

Reason?: Density matrices _____ _____ of the entropic quantities → See Nilanjana Datta's talk!

von Neumann Entropy: $S(\rho) := -\mathrm{Tr}[\rho \log \rho]$