

Replica Trick and Entanglement Entropy

The present work is focused on the implementation of path integral formalism for the calculation of entanglement entropy (EE) in quantum field theories (QFT's). First we introduce the alternative definition of EE, $S(A)$, in terms of Rényi entropy, $S_n(A)$. Then, we implement the reduced density matrix ρ_A as an euclidean path integral. Immediately after that, we consider the case of massive scalar field and compute EE across a hyperplane in Minkowski spacetime.

Having obtained that result, we will comment on the divergence structure of it, essential to understand the role of EE as a source of universal information of our theory.

arXiv

Nishioka, T. (2018). Entanglement entropy: holography and renormalization group. arXiv preprint arXiv:1801.10352.

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