Iberian Strings 2023



Contribution ID: 164

Type: not specified

A universal feature of charged entanglement entropy

Wednesday 11 January 2023 16:00 (30 minutes)

In a theory with global symmetries, one can define a notion of charged entanglement entropy, which is a function of the chemical potential conjugate to the charge contained in the entangling region. In this talk, I will show that for a general $d(\ge 3)$ -dimensional CFT, the leading correction to the uncharged entanglement entropy across a spherical entangling surface is quadratic in the chemical potential, positive definite, and universally controlled by the coefficients of the correlators <JJ> and <TJJ>. This result is motivated by analytic holographic calculations for a special class of higher-curvature gravities in general dimensions as well as for free fields in d=4. A proof for general theories and dimensions follows from previously known universal identities involving the magnetic response of twist operators.

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Session Classification: 30' Contribution