Poster Abstract for KAWS

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Non-linear Fluctuation-dissipation relation via holography

We study open systems to understand dissipation and decoherence in effective field theories (EFTs). To construct consistent open EFTs, we ask whether we can constrain open systems by imposing re-normalisability. In this direction, we construct EFTs of open systems based on some consistency conditions and study its one loop re-normalisability. To our surprise, we found that the one loop diagrams are non-local divergent (discussed in arXiv:1704.08335, 1906.10180, to appear). We did not find a good regulator to remove those divergences. A microscopic derivation of the EFT might shed some light to the origin of these divergences. But that would be a difficult question to answer.

A holographic derivation of the EFTs of open systems is feasible by using holographic Schwinger-Keldysh (SK) prescription (Glorioso et. al. arXiv: 1812.08785) Using this prescription we construct an action for open ϕ^4 theory.

In my poster, I would briefly discuss the holographic SK prescription. Then I would comment on the thermality of CFT bath and emergence of Fluctuation-dissipation relation (FDR) in the context of a particle and scalar field. I would present our result of the existence of a non-linear FDR for an interacting particle/field which relates the thermal jitter in the damping co-efficient and the non-Gaussianity in the noise (arXiv: 1906.07762) using the holographic SK prescription.