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CFT in momentum space and Anomaly Actions in Gravity

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In this talk, we present an overview of the essential features of the conformal anomaly. On general geometrical grounds, we will see how an amplitude that is both gauge and conformal invariant will contain anomalous trace contributions in the physical limit $d = 4$.

Then we will discuss how to obtain the effective anomaly action and illustrate the derivation of the conformal Ward identities directly from its path-integral definition and its Weyl symmetry, which is an alternative to the standard operatorial approach used in conformal field theories in flat space. Then we will present the method to write the general structure of correlation functions in momentum space by solving the conformal constraints. We briefly discuss the procedure for scalar four-point functions to determine the dual conformal solutions, identified only by the CWIs, and related to the conformal Yangian symmetry. We will see that in correlation functions with energy-momentum tensors, evaluated around a flat spacetime, the conformal anomaly is characterized by the (non-local) exchange of massless poles in specific form factors, which has been investigated both in free field theory and non-perturbatively.

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