

Inertial Weyl Symmetry Breaking, Dilaton, and Weyl Photon

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Globally Weyl invariant theories have a conserved current that is generally the derivative of a scalar. In general expansion, this scalar flows to a constant, K , that serves as the order parameter of symmetry breaking, eg, the decay constant of the dilaton is proportional to \sqrt{K} . If we introduce the Weyl photon the dilaton is eaten and the photon acquires a mass proportional to K . The divergence of the Weyl current is the trace anomaly, and connected to the renormalization group (RG). If the RG is interpreted as flow of coupling constants in Weyl invariant ratios, such as $VEV(\phi_i)^2/K$, then the Weyl symmetry is maintained at the quantum level.

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