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Quark and Gluon Contributions to QCD Trace Anomaly at Four Loops

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The QCD energy-momentum tensor exhibits the well-known property of trace anomaly. The anomalous contribution can be distributed among the quark and gluon parts. Although the total energy-momentum tensor remains unrenormalized owing to the conservation of energy and momentum, the individual components do go through ultraviolet renormalization. We perform this renormalization at four-loop level. As a spin-off, the phenomenological consequences of our result concerning the anomaly induced mass structure of hadrons are discussed.

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