

Henningson, M.; Skenderis, K.

The holographic Weyl anomaly. (English) Zbl 0958.81083
J. High Energy Phys. 1998, No. 7, Paper No. 23, 12 p. (1998).

Summary: We calculate the Weyl anomaly for conformal field theories that can be described via the AdS/CFT correspondence. This entails regularizing the gravitational part of the corresponding supergravity action in a manner consistent with general covariance. Up to a constant, the anomaly only depends on the dimension d of the manifold on which the conformal field theory is defined. We present concrete expressions for the anomaly in the physically relevant cases $d = 2, 4$ and 6 . In $d = 2$ we find for the central charge $c = 3l/2G_N$ in agreement with considerations based on the asymptotic symmetry algebra of AdS_3 . In $d = 4$ the anomaly agrees precisely with that of the corresponding $N = 4$ superconformal $\text{SU}(N)$ gauge theory. The result in $d = 6$ provides new information for the $(0, 2)$ theory, since its Weyl anomaly has not been computed previously. The anomaly in this case grows as N^3 , where N is the number of coincident M5 branes, and it vanishes for a Ricci-flat background.

MSC:

- 81T30** String and superstring theories; other extended objects (e.g., branes) in quantum field theory
- 81T40** Two-dimensional field theories, conformal field theories, etc. in quantum mechanics
- 83E30** String and superstring theories in gravitational theory
- 81T50** Anomalies in quantum field theory

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