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Coleman-Weinberg mechanism in a gravitational Weyl invariant theory

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We consider a massless conformally (Weyl) invariant classical action consisting
of a magnetic monopole coupled to gravity in an anti-de Sitter background spacetime. We implement quantum corrections and this breaks the conformal (Weyl) symmetry, introduces a length scale via the process of renormalization and leads to the trace anomaly. We calculate the one-loop effective potential and determine from it the vacuum expectation value (VEV). Spontaneous symmetry breaking is radiatively induced à la Coleman-Weinberg and the scalar
coupling constant is exchanged for the dimensionful VEV via dimensional transmutation. An important result is that the Ricci scalar of the AdS background spacetime is determined entirely by the value of the VEV.

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