

Exercise Sheet 2 (String Theory, LVA Nr. 136.005) due 21st of march

Exercise 3: Weyl rescaling in two dimensions

Show that in two dimensions, the effect of a Weyl rescaling $g_{mn} \rightarrow g_{mn}e^{2\Lambda}$ on the Einstein-Hilbert action is

$$\int d^2\sigma \sqrt{-\det(g)} R \rightarrow \int d^2\sigma \sqrt{-\det(g)} (R - 2D^2\Lambda) , \quad (1)$$

where R is the Ricci scalar and D is the covariant derivative with respect to the Levi-Civita connection.

Exercise 4: Weyl rescaling and the energy-momentum tensor

Show that invariance of any action under Weyl rescaling implies the vanishing of the trace of the energy-momentum tensor !