

$$S = \int_{\mathcal{M}_4} d^4x \sqrt{-g} \left[ \frac{M_p^2 R}{8\pi} - \frac{1}{2} \partial_\mu \theta \partial^\mu \theta + \xi R \theta^2 + \right. \\ \left. - \frac{1}{4} \text{Tr}[F_{\alpha\beta} F^{\alpha\beta}] + \frac{\theta}{4M_*} \text{Tr}[F_{\alpha\beta} \tilde{F}^{\alpha\beta}] + q \text{Tr}[A_\mu \mathcal{J}_5^\mu] \right]$$