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One-loop RG-flow for adjoint multi-scalar gauge theory

Friday 25 August 2023 09:50 (20 minutes)

We study the one loop renormalisation of 4d SU(N) Yang-Mills theory with M adjoint representation scalar multiplets. We calculate the coupled one-loop renormalization group flows for this theory by developing an algebraic description, which we find to be characterised by a non-associative algebra of marginal couplings. The 4d one loop beta function of the gauge coupling g^2 vanishes for the case M = 22, which is intriguing for string theory. There are real fixed flows (fixed points of $/g^2$) only for $M \geq 406$, rendering one-loop fixed points of the gauge coupling and scalar couplings incompatible.

Collaboration / Activity

Theory

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