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High Energy Physics - Theory

One-loop Renormalized Coefficient of Noncommutative Supersymmetric Yang-Mills-Chern-Simons Gauge Theories in Three Dimensions

Sendic Estrada-Jimenez, Hugo Garcia-Compean

(Submitted on 25 Jun 2011)

Recent studies of the AdS_4/CFT_3 correspondence involve the construction of a peculiar supersymmetric gauge theory on the worldvolume of multiple M2s branes as a boundary field theory. Under suitable conditions the quantum theory becomes a noncommutative supersymmetric YM-CS gauge theory which call for an study of its renormalized perturbative corrections. As a preliminary step to more general consideration, the modification of the ${\cal N}=3,2,1$ supersymmetric YM-CS gauge theory due to noncommutativity of spatial coordinates is proposed. We carry out the one-loop renormalization and a noncommutative correction for the Chern-Simons coefficient is obtained. Finally it is found that this new correction depends of the noncommutative parameter in an analytic form.

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