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Instantons in deformed supersymmetric gauge theories

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Recently, non-perturbative effects in supersymmetric gauge theories are intensively investigated by the help of closed string backgrounds. Especially, the graviphoton background is used to calculate the instanton partition function in N=2 super Yang-Mills (SYM) theory. The deformed ADHM construction of instantons is quite efficient tool for the investigation of non-perturbative effect in SYM theories. The deformation of ADHM construction is naturally understood in terms of D3/D(-1) -brane system in the presence of Ramond-Ramond (graviphoton) background. We investigate deformed instanton equations in N=4, N=2 supersymmetric gauge theories with graviphoton background. The deformed ADHM construction is derived from the deformed SYM theories by purely field theory calculation. We will show the deformed instanton effective action of N=4 SYM theory is consistent with the one obtained in N=2 SYM theory.

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