

Nonvanishing finite scalar mass in flux compactification

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We study possibilities to realize a nonvanishing finite Wilson line (WL) scalar mass in flux compactification. Generalizing loop integrals in the quantum correction to WL mass at one-loop, we derive the conditions for the loop integrals and mode sums in one-loop corrections to WL scalar mass to be finite. We further guess and classify the four-point and three-point interaction terms satisfying these conditions. As an illustration, the nonvanishing finite WL scalar mass is explicitly shown in a six dimensional scalar QED by diagrammatic computation and effective potential analysis. This is the first example of finite WL scalar mass in flux compactification.

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