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Regularization Schemes and Higher Order Corrections

Monday, 5 September 2011 14:50 (25 minutes)

I apply commonly used regularization schemes to a multiloop calculation to examine the properties of the schemes at higher orders. I find complete consistency between the conventional dimensional regularization scheme and dimensional reduction, but I find that the four-dimensional helicity scheme produces incorrect results at next-to-next-to-leading order and singular results at next-to-next-to-next-to-leading order. It is not, therefore, a unitary regularization scheme.

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