

5.5: Infinities and Renormalization

One of the key features missing in the discussion above is the fact that all the pictures I have drawn are infinite – somewhat of a severe blow. The key point is to understand that this is not a problem, but has to do with a misinterpretation of the series.

When we introduce α and e in our theory these we use the measured value of the charge of an electron – which is a solution to the full theory, not to the artificial problem with all vacuum fluctuations turned of. What it means is that we should try to express all our answers in physically sensible (measurable) quantities. Renormalisation is the mathematical procedure that does this. A theory (such as QED) is called **renormalisable** if we can make all expressions finite by re-expressing them in a finite number of physical parameters.

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