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Tales of the Unexpected: One-Loop Soft Theorems via Hidden Symmetries

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Controlling infrared divergences in QFT cross-sections has been an important phenomenological problem for many decades. Recently, there has been renewed theoretical interest, with the observation that soft theorems emerge as the Ward identities of asymptotic symmetries, at least at tree level. I shall discuss recent work probing the one-loop corrections to subleading soft theorems in the context of N=4 super-Yang-Mills theory. In particular, I shall outline how hidden symmetries may be used to constrain the form of such corrections. Further, I shall present new computations which determine the corrections precisely, revealing them to have a surprisingly simple form. These results may find fruitful application in QCD resummation and the development of holographic theories. The talk is based on arXiv:1511.06716.

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