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Higgs Mechanism from On-Shell Massive Amplitude

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Recently an on-shell formalism of scattering amplitudes for all masses and spins have been developed by Nima, Tzu-Chen and Yu-tin. In particular, Higgs mechanism can be understood as IR unification of different UV massless helicity amplitudes. This is complementary to the classic results by Cornwall et al, who have proved that the only consistent UV theory of interacting massive scalar, spinor and vector fields is equivalent to the spontaneously broken gauge theory. In this talk, I will talk about how the elegant on-shell massive formalism can help to understand the Higgs mechanism from IR deformation with arbitrary coupling coefficients to the UV gauge-invariant theory by imposing the tree-level unitarity consistently. I will also briefly discuss about possible phenomenological application of the on-shell massive formalism.

Summary

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