



Contribution ID: 22

Type: **Talk**

The physical spectrum of a partially Higgsed gauge theory

Thursday, July 28, 2016 3:20 PM (20 minutes)

The description of electroweak physics using perturbation theory is highly successful. Though not obvious, this is due to a subtle field-theoretical effect, the Fröhlich-Morchio-Strocchi mechanism, which links the physical spectrum to that of the elementary particles. This works because of the special structure of the standard model, and it is not a priori clear whether it works for structurally different theories.

Candidates for conflicts are, e.g., partially Higgsed gauge theories. We study this situation in an $SU(3)$ gauge theory with one fundamental Higgs field and a breaking pattern $SU(3) \rightarrow SU(2)$. We determine the leading order predictions for the gauge invariant spectrum in this theory and discuss the results from lattice simulations.

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Session Classification: Physics Beyond the Standard Model

Track Classification: Physics Beyond the Standard Model