



ID de Contribution: 3

Type: **Ordinary**

A Light Dynamical Scalar Boson

jeudi 7 mars 2013 18:45 (15 minutes)

With the discovery of a Higgs-like resonance at ATLAS and CMS, the understanding of the electroweak symmetry breaking origin seems a much closer goal. A strong dynamics at relatively low scales is still a good candidate. In this talk, the complete effective Lagrangian up to $d < 6$ will be presented, both for the gauge and the flavour sector. Interesting features in the flavour phenomenology will be discussed.

Summary

In the talk I will present the results of a couple of papers on a light dynamical Higgs. Indeed, we have generalized the basis of CP-even chiral effective operators describing a dynamical Higgs sector, to the case in which the Higgs-like particle is light. Gauge and gauge-Higgs operators are considered up to mass dimension five. The analysis completes the tool needed to explore at leading order the connection between linear realizations of the electroweak symmetry breaking mechanism - whose extreme case is the Standard Model - and non-linear realizations with a light Higgs-like particle present. It may also provide a model-independent guideline to explore which exotic gauge-Higgs couplings may be expected, and their relative strength to Higgsless observable amplitudes. Furthermore, the Higgs-fermion couplings are sensitive probes of possible new physics behind a stable light Higgs particle. It is then essential to identify the flavour pattern of those interactions. We considered in this setup, with a light dynamical Higgs, the implications within the Minimal Flavour Violation ansatz. The dominant effects on flavour-changing Higgs-fermion couplings stem in this context from operators with mass dimension ≤ 5 , and we analyze all relevant chiral operators up to that order, including loop-corrections induced by 4-dimensional ones. In particular, the coefficient of a genuinely CP-odd operator is only softly constrained and therefore its impact is potentially interesting.

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Classification de Session: Beyond the SM

Classification de thématique: Theory