



ID de Contribution: 51

Type: **Ordinary**

Aligned two doublet model

mardi 17 mars 2015 17:00 (15 minutes)

I will discuss the phenomenology of models with two scalar doublets and no flavour-changing neutral currents at tree-level. Implications of flavour constraints and measurements of the 125 GeV scalar properties will be discussed keeping the generic Yukawa structure of the aligned two doublet model. Particular limits with a reduced number of free parameters, such as the usual models based on discrete Z_2 symmetries will also be considered.

Summary

A widely studied extension of the Standard Model (SM) scalar sector consists of adding a second scalar doublet to the SM field content. In the general uncontrolled flavour changing neutral currents (FCNC) appear then at tree-level leading to a phenomenological problem. The hypothesis of natural flavour conservation (NFC) is the most popular solution to this issue. By limiting the number of Higgs fields coupling to a given type of fermion to be at most one, the absence of dangerous FCNC is guaranteed. An alternative solution is that of Yukawa alignment. In the aligned two doublet model it is assumed that the Yukawa matrices are aligned in flavour space so that no FCNC appear at tree level. All the different models with NFC are recovered in particular limits of the aligned two doublet model.

Current measurements of the 125 GeV scalar boson properties together with direct searches for new scalars at colliders, flavour constraints and electroweak precision data set strong bounds on the parameter space of models with two scalar doublets. I will discuss the main implications of current data within the framework of the aligned two doublet model. Models with NFC will also be discussed along the same lines.

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Classification de Session: The Scalar Sector

Classification de thématique: Theory