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Old Work plan, replaced by coupling document

1. Coupling parameter models (X is still to be exactly defined. Functional expressions for X( ) and X(g) are needed for 2. and 5.)
    1. One parameter model with an overall scale (μ). Already used in 2011 results.
    2. Two parameter model with X(V) scaling the gauge couplings and X(F) scaling the Yukawa couplings. Ratios within the gauge and fermion couplings fixed to the SM. Interference terms, if they can't be factorized by a clever choice of X, as in the SM.
    3. Four parameter model with X(V), X(F) and effective parameters X( ) for the photon decay and X(g) for the gluon decay/production. Ratios within the gauge and fermion couplings as in the SM. Interference terms, if they can't be factorized by a clever choice of X, as in the SM.
    4. A model with X(W), X(Z), X( ), X(b), X( ), X(g), (+ X(t) if ttH production becomes available). Interference terms, if they can't be factorized by a clever choice of X, as in the SM.
    5. A model with X(W), X(Z), X( ), X(b), and X(t) (assuming no new particles in the photon and gluon loops). Interference terms, if they can't be factorized by a clever choice of X, as in the SM.
2. Available options for X (discussion is ongoing and so far no agreement on a representation. Proposals are welcome!):
    1. Coupling strength scale factor g_i that would appear directly at the Higgs vertex (e.g. (WH) ~ g_W^2 for i = W)
    2. The partial decay width G_i (e.g. (WH) ~ G_W for i = W)
    3. Separate by observable initial/final states (e.g. 4μ instead of ZZ) -> postpone for now because of limited available data
3. Relative and absolute measurements
    1. Without further assumptions one can fit for (If all correlations are kept in the fit, both are strictly identical)
        1. ratios X_i/X_j and one global scale $\mu=X_i^2$ / $_H$
        2. X_i / sqrt($_H$)
    2. Assumptions for an absolute coupling measurement:
        1. no invisible/undetectable decays
        2. only the undetectable SM decays from H cc, H gg, ... and these are calculated by assuming that $X_c=X_b$ or something similar.
        3. $_W$ < $_W$(SM)
        4. Anything else?
    3. Start with C.1, C.2.b, C.2.c
4. Can combine any option in C with every coupling parameter model in A.

A. Determination of Spin and CP quantum numbers

Old Action items

1. Agree on a definition for coupling parameters that is well defined from the theory side and usable in an experimental fit
2. Calculate theory uncertainties for whatever coupling parameters are used or give at least some limit estimate on the uncertainty
3. If we have to continue with LO coupling parameter definitions, give some rough estimates for the uncertainties
4. Check with jet group if additional uncertainties appear for a coupling fit due to analysis in exclusive jet bins

-- MichaelDuehrssen - 10-Aug-2012

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