



ID de Contribution: 5

Type: **Ordinary**

The global electroweak fit

mercredi 18 mars 2015 08:30 (15 minutes)

We present an update of the global electroweak fit using electroweak next-to-next-to-leading order (NNLO) calculations for all precision observables that enter the fit. The availability of NNLO corrections allows for the first time the inclusion of realistic estimates of theoretical uncertainties due to missing higher orders. The knowledge of the mass of the Higgs boson improves the precision of the predictions in the global electroweak fit considerably and the global fits are used as powerful tools to assess the validity of the Standard Model and to constrain scenarios for new physics.

We present updated constraints on two Higgs doublet models, dimension-6 operators and a model with modified Higgs couplings to bosons and fermions. We show that in many cases the Higgs signal strength measurements give complementary information to constraints obtained from electroweak precision observables.

Future measurements at the LHC and an expected $e+e-$ collider promise to improve the experimental precision of key observables used in the fit. We assess the influence of present and future experimental and theoretical sources of systematic uncertainties on the fit predictions.

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Classification de Session: Standard Model

Classification de thématique: Theory