IPARCOS

Seminario de Física Teórica

Towards a global analysis of the Standard Model Effective Field Theory

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The Standard Model Effective Field Theory (SMEFT) can be considered as ``the new Standard Model'': a systematic, model-independent parametrisation of the low-energy deformations arising in any UV complete BSM theory that reduces to the SM. Here I present a novel framework for carrying out global analyses of the (SMEFT): SMEFiT.

This approach is based on the Monte Carlo replica method, extensively deployed in the NNPDF analyses of the proton structure, for deriving a faithful estimate of the experimental and theoretical uncertainties and enables one to construct the probability distribution in the space of the SMEFT degrees of freedom. As a proof of concept of the SMEFiT methodology, I present an extensive study of the constraints on the SMEFT provided by top quark production measurements from the LHC. I then present first results of a global fit to top, Higgs, and electroweak precision observables. I then discuss a complementary approach to constrain the SMEFT parameter space pace based on Bayesian inference. Finally I also describe the first steps towards a joint determination of the SMEFT degrees of freedom and of the proton structure, an essential ingredient for the interpretation of future LHC precision measurements.