

SIMUnet: an open-source tool for simultaneous global fits of EFT Wilson coefficients and PDFs

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We present the open-source SIMUnet code, designed to fit Standard Model Effective Field Theory (SMEFT) Wilson coefficient alongside Parton Distribution Functions (PDFs) of the proton. SIMUnet can perform SMEFT global fits, as well as simultaneous fits of the PDFs and of an arbitrarily large number of SMEFT degrees of freedom, by including both PDF-dependent and PDF-independent observables. SIMUnet can also be used to determine whether the effects of any New Physics models can be fitted away in a global fit of PDFs. SIMUnet is built upon the open-source NNPDF code and is released together with documentation, and tutorials. To illustrate the functionalities of the new tool, we present a new global analysis of the SMEFT Wilson coefficients accounting for their interplay with the PDFs. We increment our previous analysis of the LHC Run II top quark data with both (i) the Higgs production and decay rates data from the LHC, and (ii) the precision electroweak and diboson measurements from LEP and the LHC.

Primary authors: HAMMOU, Elie (University of Cambridge, DAMTP); MOORE, James (University of Cambridge); MANTANI, Luca (DAMTP, University of Cambridge); MADIGAN, Maeve (University of Cambridge); Mr MORALES ALVARADO, Manuel (University of Cambridge); UBIALI, Maria; COSTANTINI, Mark (University of Cambridge); KASSABOV, Zahari (University of Cambridge)

Presenter: COSTANTINI, Mark (University of Cambridge)

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