



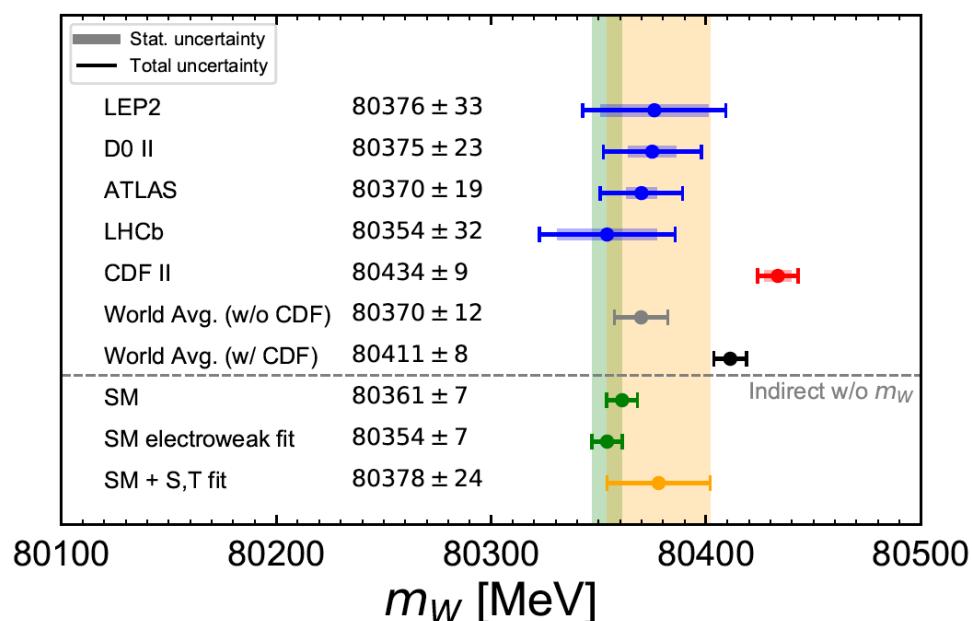
# SMEFT Analysis of $m_W$ .

Tuesday, 03 May, 2022

Webcast 16:00 h

John Ellis (KCL)

Fitmaker is a fast tool for making global fits to electroweak, Higgs, and diboson data in the Standard Model Effective Field Theory (SMEFT) including dimension-6 operators at linear order. We extend our previous analysis of LHC and other data to incorporate the recent CDF measurement of  $m_W$ . We find that the global fit can be improved by including any one of the four SMEFT operators  $O_{HWB}$ ,  $O_{HD}$ ,  $O_{ll}$  or  $O_{HL}^3$  with a non-zero coefficient, with no significant tension with other electroweak precision data or CKM unitarity. We then analyse which tree-level single-field extensions of the Standard Model could generate such operator coefficients with the appropriate sign, and discuss the masses and couplings of these fields that best fit the CDF measurement and other data. Our global fit favours either a singlet vector boson, a scalar electroweak triplet with zero hypercharge or a vector electroweak triplet with unit hypercharge, followed by a singlet heavy neutral or charged lepton, all with masses in the multi-TeV range for unit coupling. I will also comment on the possibility of a supersymmetric interpretation of the CDF measurement.



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