

Precise SM measurements as BSM probes: a new purpose for the W mass measurement

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The precise measurement of the Standard Model parameters is not only a consistency check of the SM itself, but it also represents a powerful probe for New Physics. This is well known in the case of heavy new physics, that might show-up indirectly by modifying the relations among the SM parameters.

On different lines, we argue that precise SM measurements can also be repurposed to constrain light new physics that can be directly produced, distorting the kinematic distributions.

We explore this paradigm revisiting the W mass measurement. For example, invisible new physics might pollute the leptonic decay of the W, modifying the MET and consequently the kinematic distributions exploited to extract the W mass. The precise measurements of CDF, ATLAS and LHCb guarantee great control on these new physics effects, so that, as byproduct, we have competitive probes for New Physics.

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