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# Repurposing Precision SM Measurements to Constraint New Physics

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We show how precision SM measurements can be repurposed to constraint certain types of new physics (NP) without invoking SMEFT. Motivated by highly precise measurement of W mass by the CDF collaboration, we demonstrate our proposal for the specific case of W mass data. W boson gives lepton + MET final state, which makes it special because it cannot be reconstructed completely. Any NP, which can give the same final state, can pollute W mass data. W mass is measured by fitting $p_T^l$, $M_T$ and $p_T^{miss}$ spectra, using templates calculated using SM. Any new contribution to the spectra can change the shapes. Hence, any deviations in the observed spectra from the expectation could give us a hint of NP. On the flip side, agreement between the measured shapes and the SM expectation can give constraints on NP. We consider multiple BSM scenarios that can creep into W data, find expected constraints and measure them against best existing bounds on the models we analyze.

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