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Two-loop investigation of new physics effects on the W -boson mass from a doublet extension of the SM Higgs sector

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Recently, the CDF collaboration has reported a new precision measurement of the W -boson mass M_W , exhibiting a large deviation from the value predicted by the Standard Model (SM).

In this talk, I will investigate possible new physics contributions to M_W from extended Higgs sectors, focusing on the Two-Higgs-Doublet Model (2HDM) as a concrete example. Employing predictions for the electroweak precision observables in the 2HDM at the two-loop level and taking into account further theoretical and experimental constraints, I will identify parameter regions of the 2HDM in which the prediction for M_W is close to the new CDF value. I will additionally discuss the compatibility of these regions with precision measurements of the effective weak mixing angle and the total width of the Z boson.

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