

Theory Keynote Talk (Special CTP Seminar): The W-boson Mass Puzzle: Examining the Interplay Between Theory and Experiment

Monday 9 January 2023 14:00 (1 hour)

Recently, the Tevatron CDF collaboration reported a highly precise measurement of the W-boson mass with an uncertainty of 0.1 per-mille. This measurement is in significant tension with Standard Model global fits and earlier measurements. The W-boson mass is an input parameter in the Standard Model, and its determination relies heavily on theory predictions. However, these predictions have uncertainties that are orders of magnitude larger, which raises the question in how far theory uncertainties enter the measurement and translate into W-mass uncertainties. In this talk, we discuss the challenges in accurate theory predictions and their impact on the W-boson mass measurements. We explore the significance of the tension between the CDF measurement and previous results, and discuss potential avenues for improving theory predictions in future measurements.

Presenter: NEUMANN, Tobias