



Contribution ID: 1314

Type: **Parallel Talk**

High precision measurement of the W-boson mass at CDFII

Thursday, 7 July 2022 17:00 (15 minutes)

The mass of the W boson, one of the most important fundamental parameters in particle physics, is tightly constrained by the symmetries of the standard model. Following the observation of the Higgs boson and obtaining its measured mass, the standard model prediction of the W boson mass can be constrained to better than 10 MeV. An experimental measurement of the W boson mass to that level of precision represents a powerful test of the model. We measure the W-boson mass, M_W , using data corresponding to 8.8 fb^{-1} of integrated luminosity collected in proton-antiproton collisions at 1.96 TeV center-of-mass energy with the CDF II detector during the Run 2 (2001-2011) of the Fermilab Tevatron collider. A sample of approximately four million W-boson candidates is used to obtain $M_W = 80\,433.5 \pm 6.4_{\text{stat}} \pm 6.9_{\text{syst}} = 80\,433.5 \pm 9.4 \text{ MeV}/c^2$, whose precision exceeds that of all previous measurements combined. This measurement is in significant tension with the standard model expectation.

In-person participation

Yes

Primary authors: CHIARELLI, Giorgio (Istituto Nazionale di Fisica Nucleare); HAYS, Chris (University of Oxford (GB))

Presenter: HAYS, Chris (University of Oxford (GB))

Session Classification: Top quark and EW Physics

Track Classification: Top quark and EW Physics