

PRECISION MEASUREMENT OF THE W BOSON MASS WITH 1 fb^{-1} OF DZero
RUN IIA DATA

Abstract

by

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This thesis is a detailed presentation of a precision measurement of the mass of the W boson. It has been obtained by analyzing W to $e\nu$ decays. The data used for this analysis was collected from 2002 to 2006 with the DZero detector, during Run IIA of the Fermilab Tevatron collider. It corresponds to a total integrated luminosity of 1 fb^{-1} . With a sample of 499,830 W to $e\nu$ candidate events, we obtain a mass measurement of $M_W = 80.401 \pm 0.043 \text{ GeV}$. This is the most precise measurement from a single experiment to date.