

Abstract

The first analysis of diffractively produced Z bosons in the muon decay channel is presented, using data taken by the DØ detector at the Tevatron at $\sqrt{s} = 1.96$ TeV. The data sample corresponds to an integrated luminosity of 109 pb^{-1} .

The diffractive sample is defined using the fractional momentum loss ξ of the intact proton or antiproton measured using the calorimeter and muon detector systems. In a sample of 10791 $(Z/\gamma)^* \rightarrow \mu^+\mu^-$ events, 24 diffractive candidate events are found with $\xi < 0.02$.

The first work towards measuring the cross section times branching ratio for diffractive production of $(Z/\gamma)^* \rightarrow \mu^+\mu^-$ is presented for the kinematic region $\xi < 0.02$. The systematic uncertainties are not yet sufficiently understood to present the cross section result.

In addition, the first measurement of the efficiency of the Run II DØ Luminosity Monitor is presented, which is used in all cross section measurements. The efficiency is:

$$\varepsilon_{LM} = (90.9 \pm 1.8)\% .$$