Title: Measurement of Z to mumu cross section in pp collisions at sqrt(s)=13TeV

Nam Jong Woo

1. Introduction

Why?

Studying processes of Z boson decay.

Understand how to find and reconstruct elementary particles from collision detectors.

This paper describes a measurement of cross section for Z->mumu in pp collisions at sqrt(s)=13TeV.

The production of Z bosons in pp collisions is mainly via the weak Drell-Yan process consisting of the annihilation of a quark and an antiquark. The production process pp->Z+X is dominated by uubar and ddbar->Z.

2. CMS detector

CMS detector contains a silicon pixel and strip tracker, an electromagnetic calorimeter (ECAL), a hadron calorimeter (HCAL), superconducting solenoid, and a muon detector. The solenoid provide 3.8T magnetic field and this bends muon trajectories oppositely inside and outside. Muons are detected from silicon pixel and strip tracker, and muon detector.

A right-handed coordinate system is used in CMS, with the origin at the nominal

interaction point, the x-axis pointing to the center of the LHC ring, the y-axis pointing

up (perpendicular to the LHC plane), and the z-axis along the anticlockwise-beam direc-

tion. The polar angle θ is measured from the positive z-axis and the azimuthal angle φ is

measured (in radians) in the xy-plane. The pseudorapidity is given by η = − ln tan(θ/2).

Muons are detected in the pseudorapidity window |η| < 2.4, with detection planes

based on three technologies: drift tubes, cathode strip chambers, and resistive plate cham-

bers. A high-pT muon originating from the interaction point produces track segments

typically in three or four muon stations. Matching these segments to tracks measured in

the inner tracker results in a pT resolution between 1 and 2% for pT values up to 100 GeV.

3. Analysis

<simulation samples>

4. Procedure

<Event selection>

muon isolation

60<mass <120GeV

5. Result

6. Conclusion