



• Coverage up to **h**=±2. • Three layers: one inside (A), two outside (B, C) of the toroid magnet • Consists of scintillators and drift tubes





Forward Mini-drift



**New electronics, Trigger, DAQ** 

Visual Light Photon Counter



... and its response to 0, 1, 2, 3 pe:





A measurement of the Z - > mm cross-section is made using an  $\mathbf{L}dt$  of 116.8 pb<sup>-1</sup>

## **Selection criteria:**

\* Require 2 oppositely charged loose muons matched to central tracks with  $p_T > 15$  GeV \* Timing, distance of closest approach, and isolation cuts to remove background from: - cosmics - bb decays into muons

\* Candidate events must fire di-muon trigger

\* Muon candidates must be within geometrical acceptance of muon chambers:

- |**h**| < 1.8

- if  $|\mathbf{h}| < 1.25$ , muon candidate must not be in **f** $\hat{\mathbf{I}}$  [4.25, 5.15]

## This yields 6126 Z -> mmcandidates



l background



**DÆ** detector provides unique opportunities for studying Electroweak Physics

## **General features of W and Z production**

-10 -5 0

Why do we care about W and Z Production \* Test consistency of the SM couplings \* Constrain proton PDF's \* Understand higher-order QCD corrections \* M<sub>w</sub> constrains mass of Higgs



Why do we really care about W and Z Production \* Benchmarks our level of understanding of the experiment Efficiencies, Backgrounds, Luminosity We use these signals to tune up triggers & algorithms \* If experimental and theoretical uncertainties are small, W & Z can be used to measure luminosity, normalize to other measurements, at least provides a monitor \* The study of W & Z production is preliminary to the grander goals of Run II - W boson mass and other precision EWK measurements - Top Quark Studies - (W or Z) + Higgs



A measurement of the W - >  $\mathbf{m}$  cross-section is made using an  $\mathbf{d}\mathbf{d}\mathbf{t}$  of 17.3 pb<sup>-1</sup> (Data sample used in this analysis was collected between September '02 and January '03) Selection criteria:



\* Require an only one good quality muon matched to a central track with  $p_T > 20$  GeV \* Muon candidate must be in the fiducial acceptance defined as:

- |**h**| < 1.6

- if $ \mathbf{h}  < 1.1$ , muon candidate must not be in <b>fÎ</b> [4.25, 5.15]	Estimated backgro
Events must pass single high-p <sub>T</sub> muon trigger	<b>bb</b> : $f = 0.058$
Missing E <sub>T</sub> must be above 20 GeV	Z -> mm f = 0.090
Isolation and timing cuts were applied to remove background from cosmics and bb	W - > <b>tn</b> : <b>f</b> = 0.036



 $s \cdot Br(W - > m) = 3226 \pm 128 (stat.) \pm 100 (syst.) \pm 323 (luminosity) pb$ 

## **DØ and CDF RunII Preliminary Results on W and Z cross-sections**



