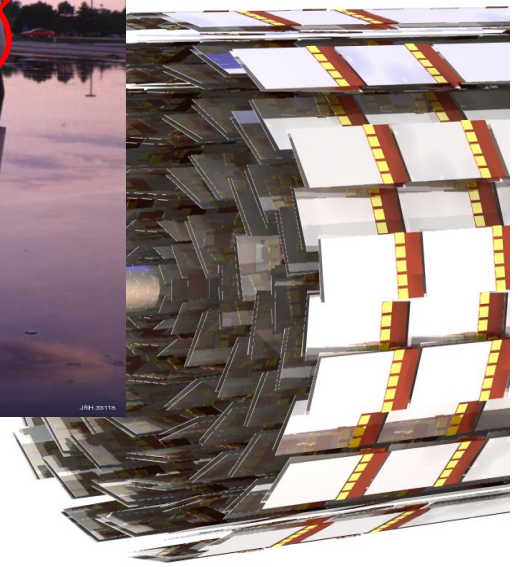
Full reconstruction of B mesons and the B^+ Lifetime at DØ



Pedro Podesta

CINVEAV , Mexico

April 5 2003 Philadelphia

B PHYSICS QUIZ

What is the first step in CPV measurement?

✔ **Fully reconstructed B mesons**

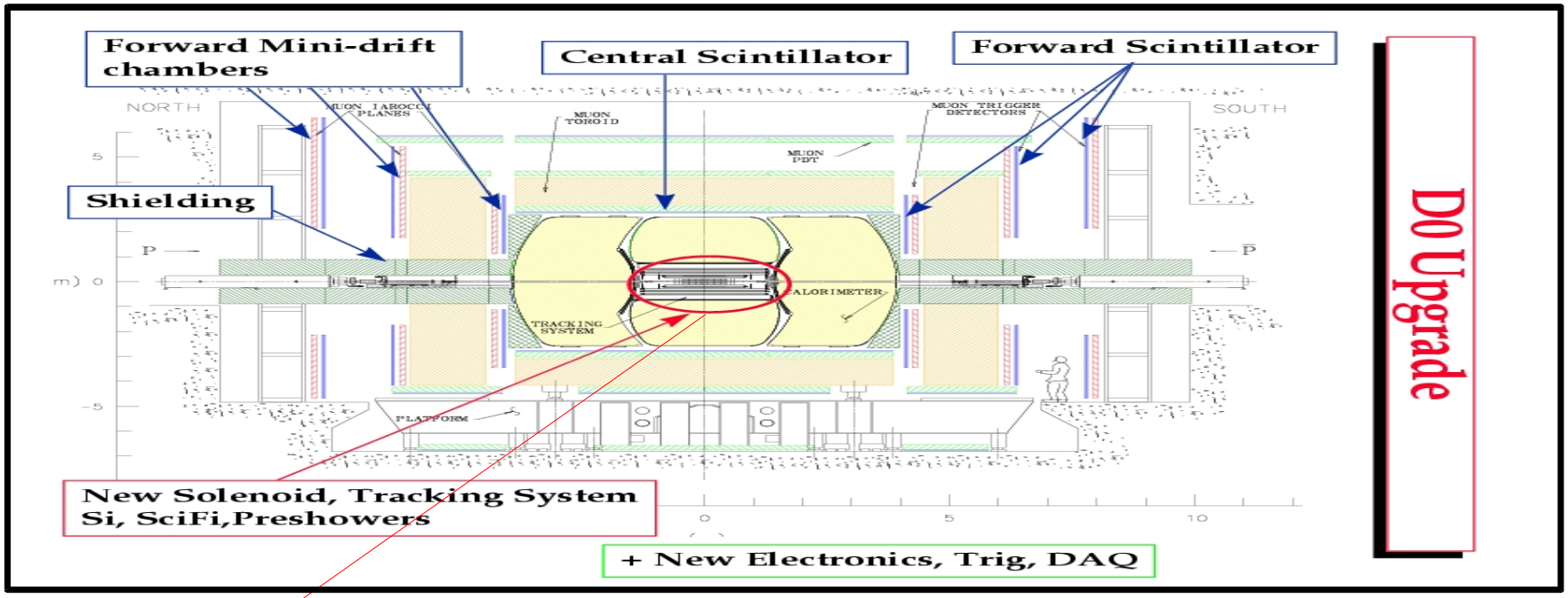
And the second one?

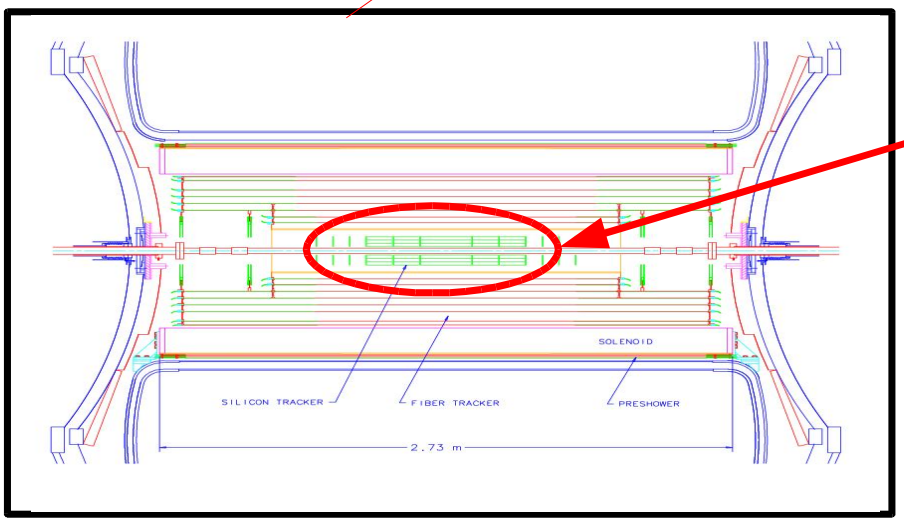
✔ **Reconstruct proper time**

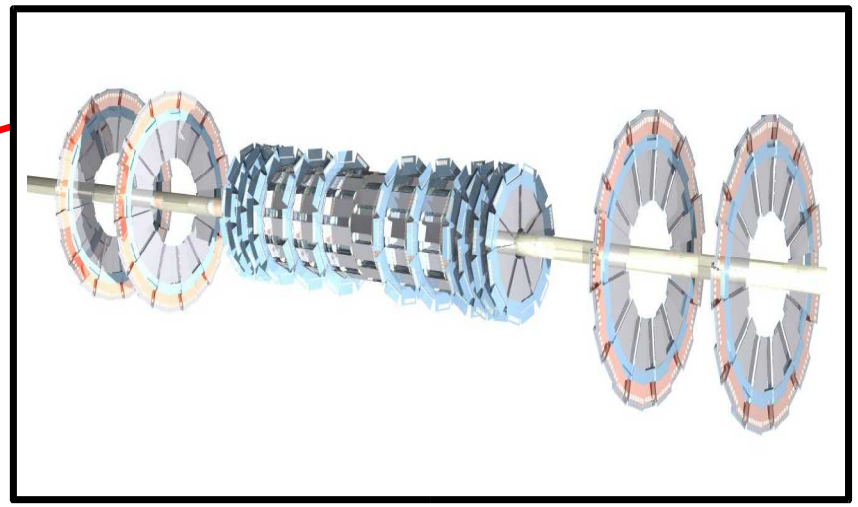
The third one?

Take a cup of coffee and work more ...

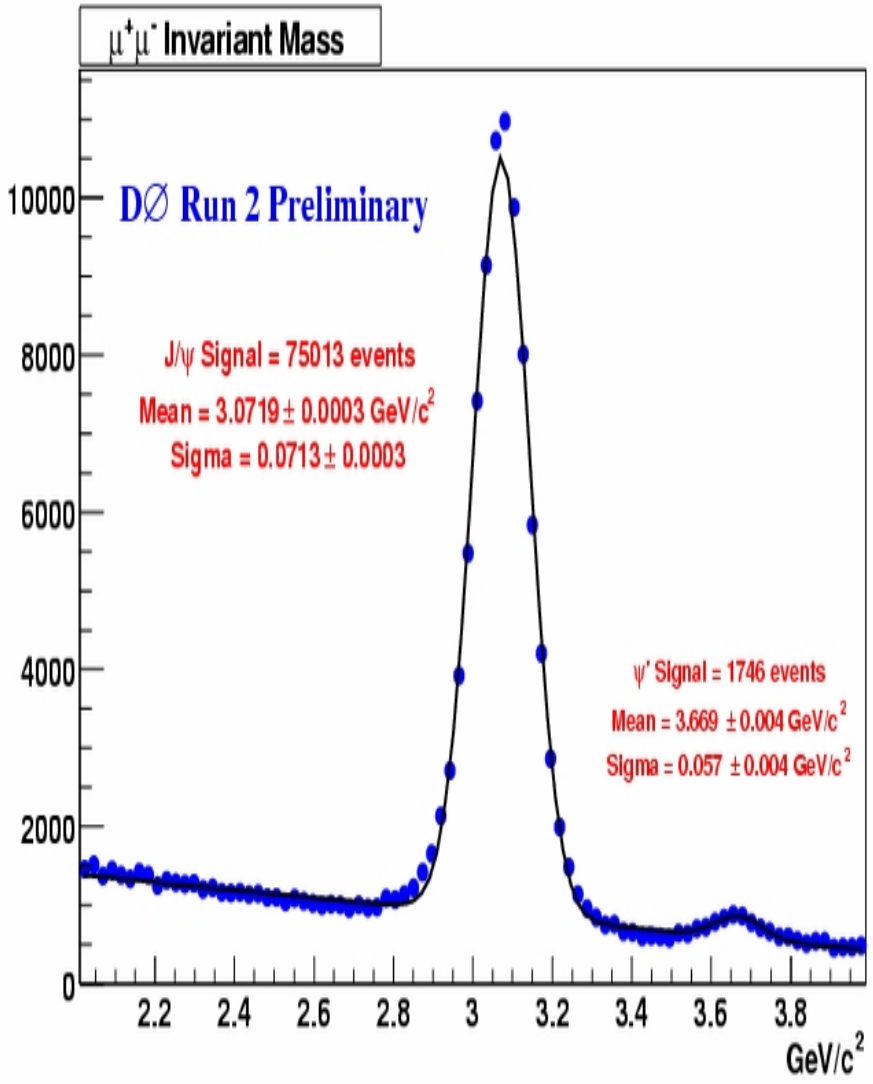
DØ TRACKING


Forward Mini-drift chambers
Central Scintillator
Forward Scintillator
Shielding
New Solenoid, Tracking System
Si, SciFi,Preshowers
+ New Electronics, Trig, DAQ
D0 Upgrade
NORTH
SOUTH
MUON IAROCCI PLANES
MUON TOROID
MUON PDT
MUON TRIGGER DETECTORS
TRACKING SYSTEM
CALORIMETER
PLATFORM

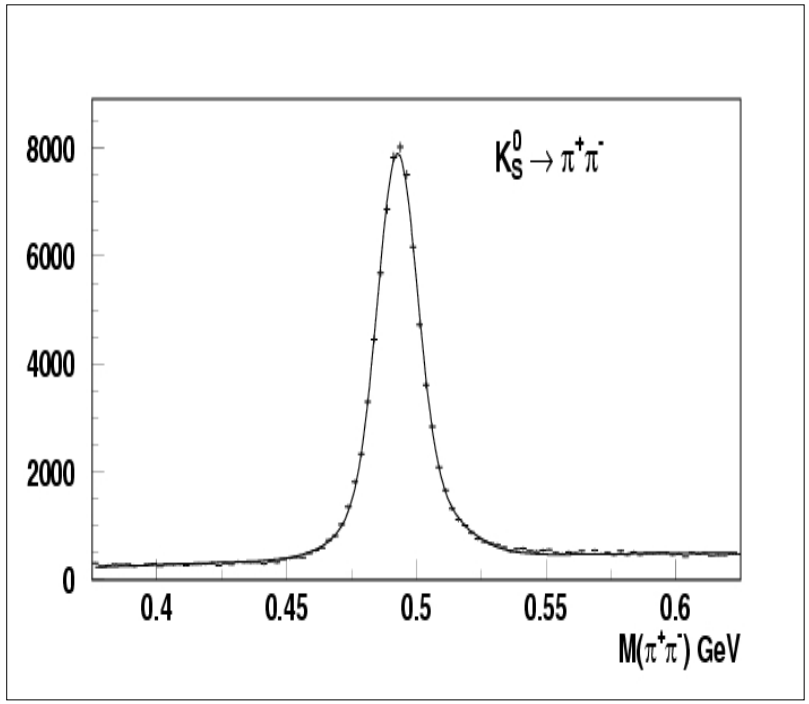

SOLENOID
SILICON TRACKER
FIBER TRACKER
PRESHOWER
2.73 m



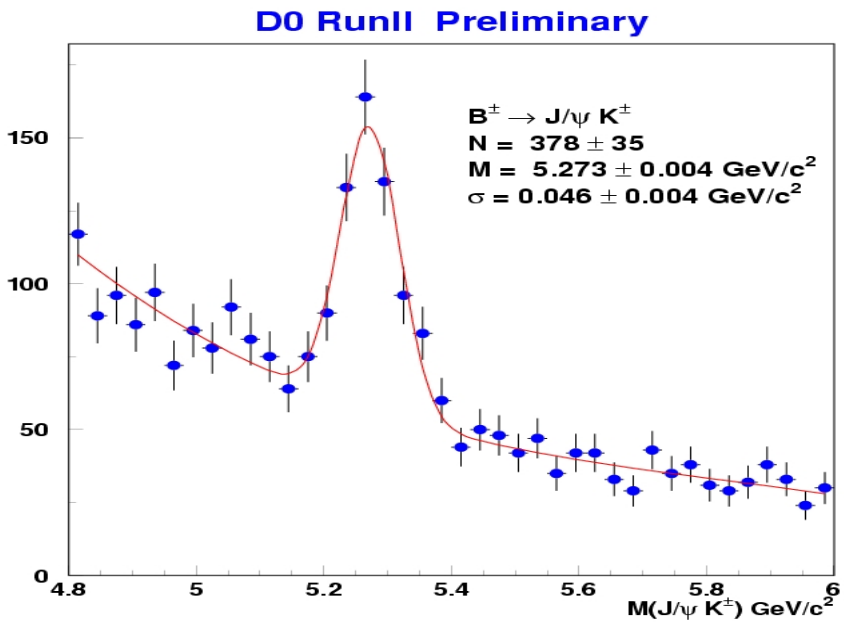
B RECONSTRUCTION

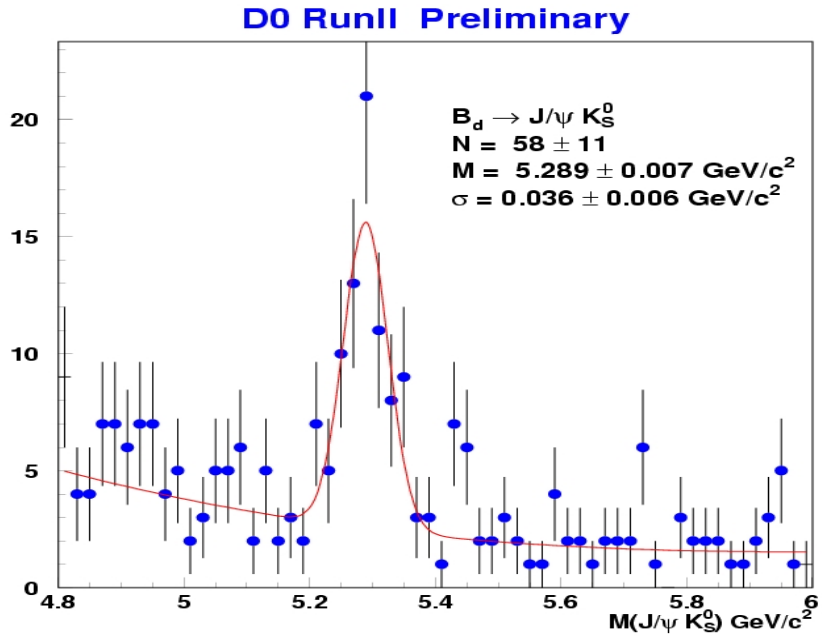


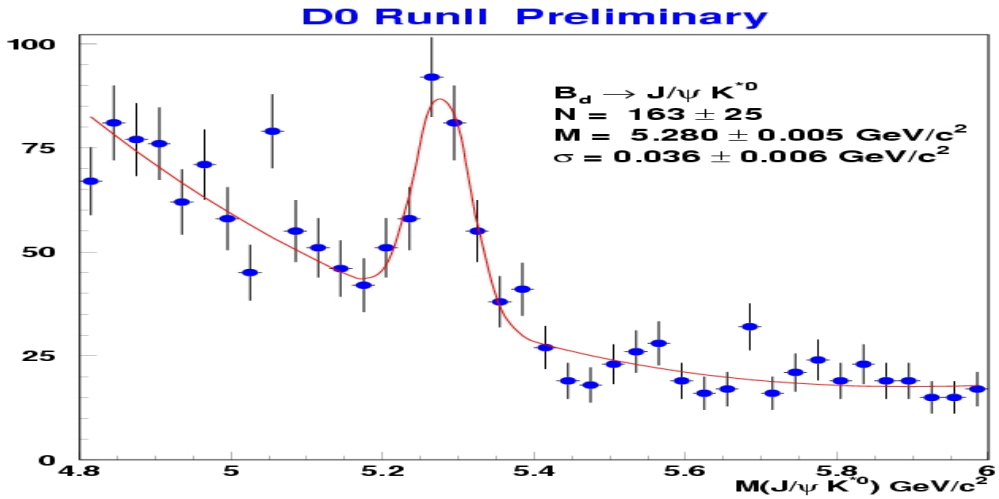
Trigger on J/ψ -> μ^+ μ^-
We have a J/ψ signal and combine with
1 track K^+
2 tracks K^0_S, K*



B RECONSTRUCTION

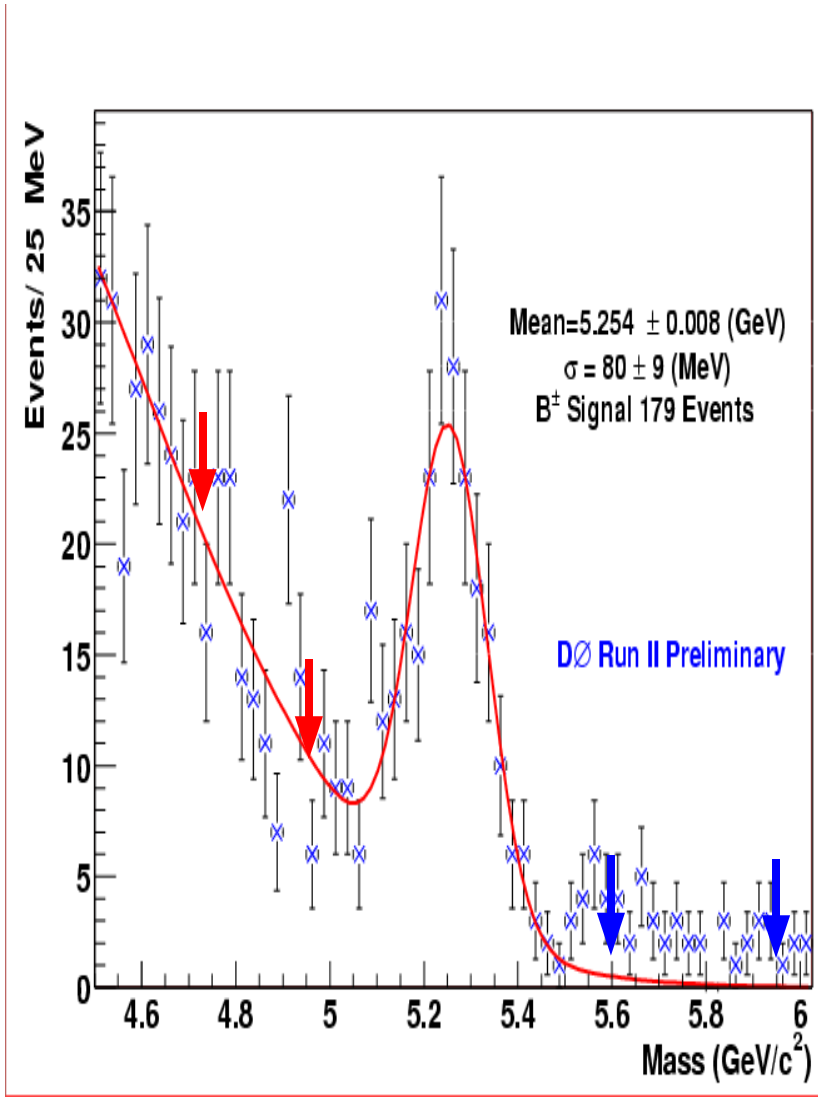


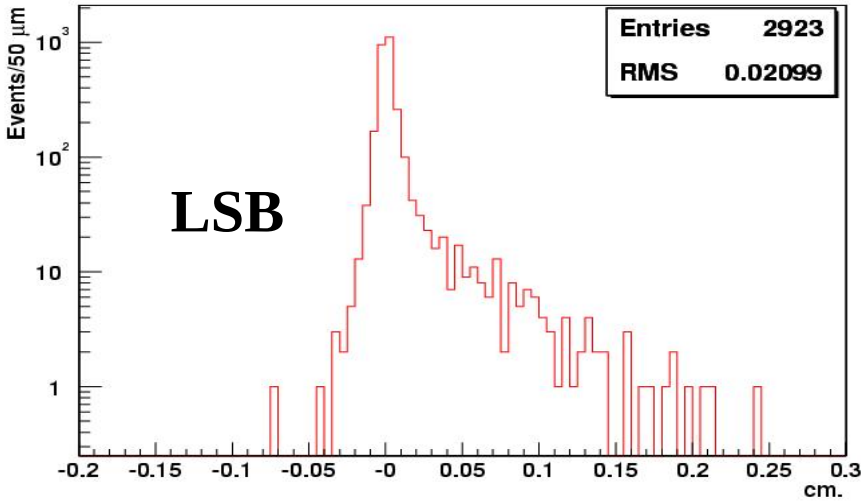


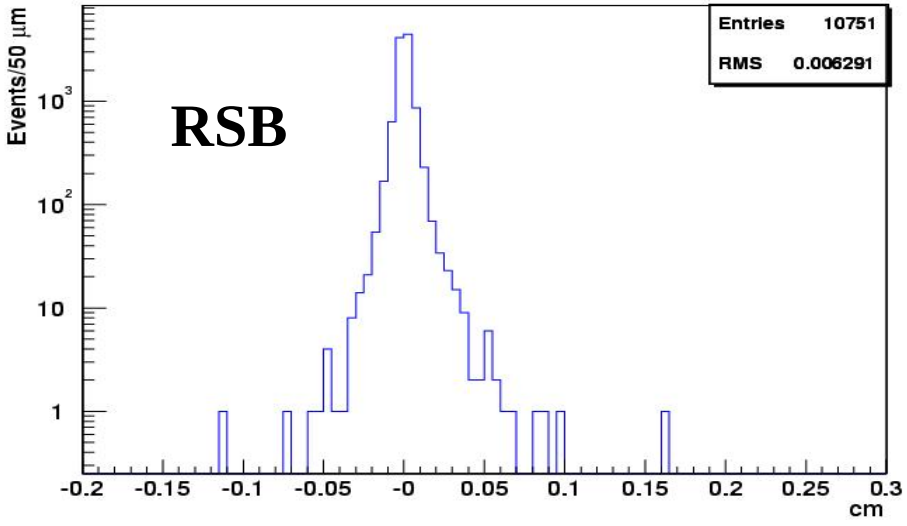


40 pb

BACKGROUNDS AND SIDEBANDS



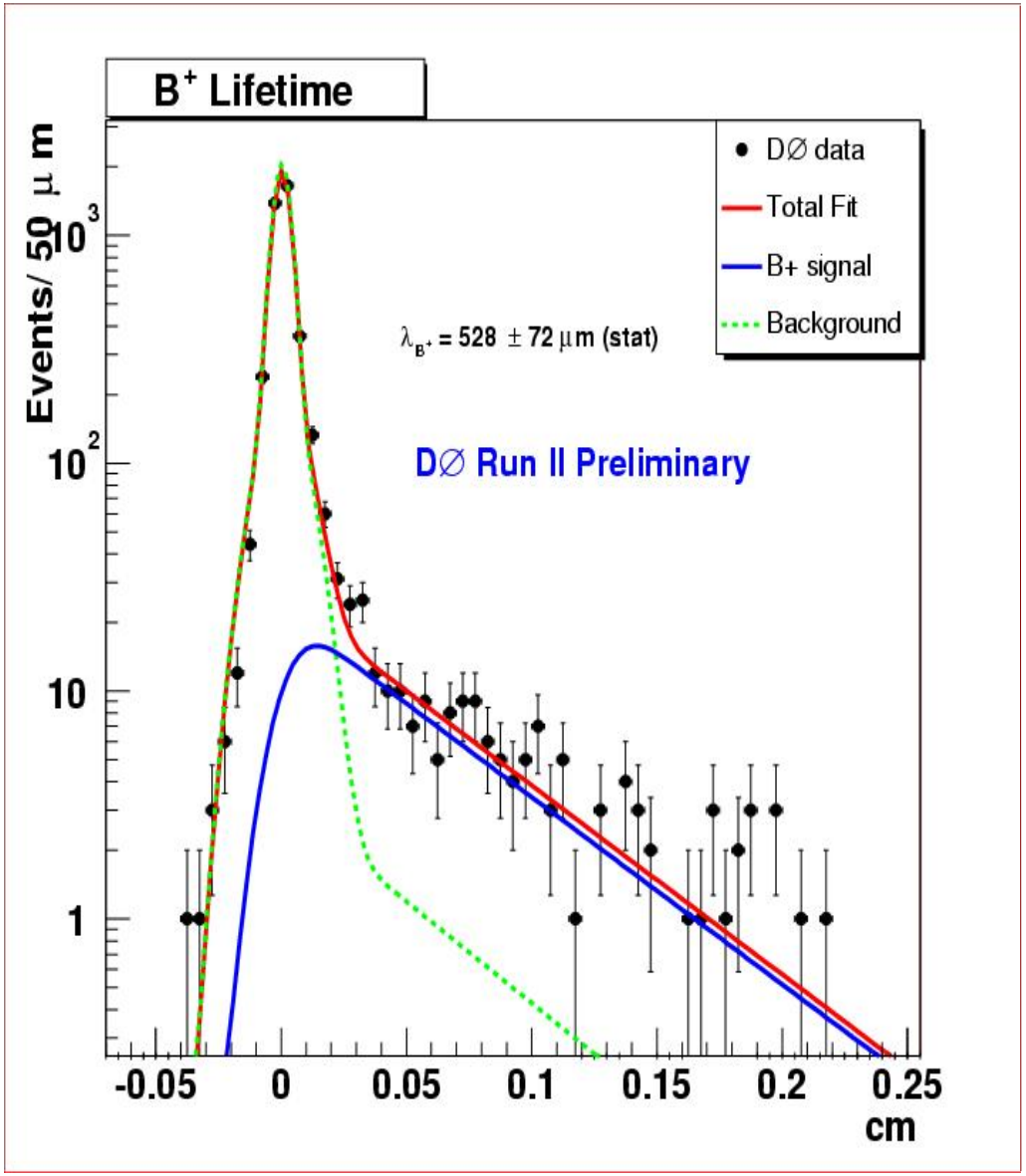




B^+ LIFETIME

- Use J/ψ Vertex
- $J/\psi + K^+$ Vertex used to choose candidates
- Signal : Exp $\times$ Gauss convoluted
- Background : Two Gaussians

$B^{\pm}$ LIFETIME



$\lambda_{B^+} = 528 \pm 72\ \mu m$ (stat)

$\langle\tau\rangle = 1.584 \pm 0.216$ ps (stat)

PDG Value

$\langle t\rangle = 1.674 \pm 0.018$ ps

RESULTS AND EXPECTATIVES

- First B mesons reconstructed at DØ
- B^+ lifetime results agree with PDG
- Get the systematics errors
- Get lifetime for B^0 , Λ , B_s