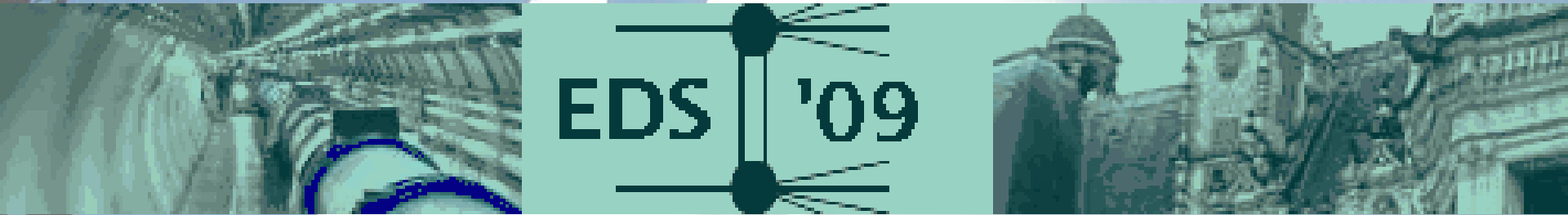


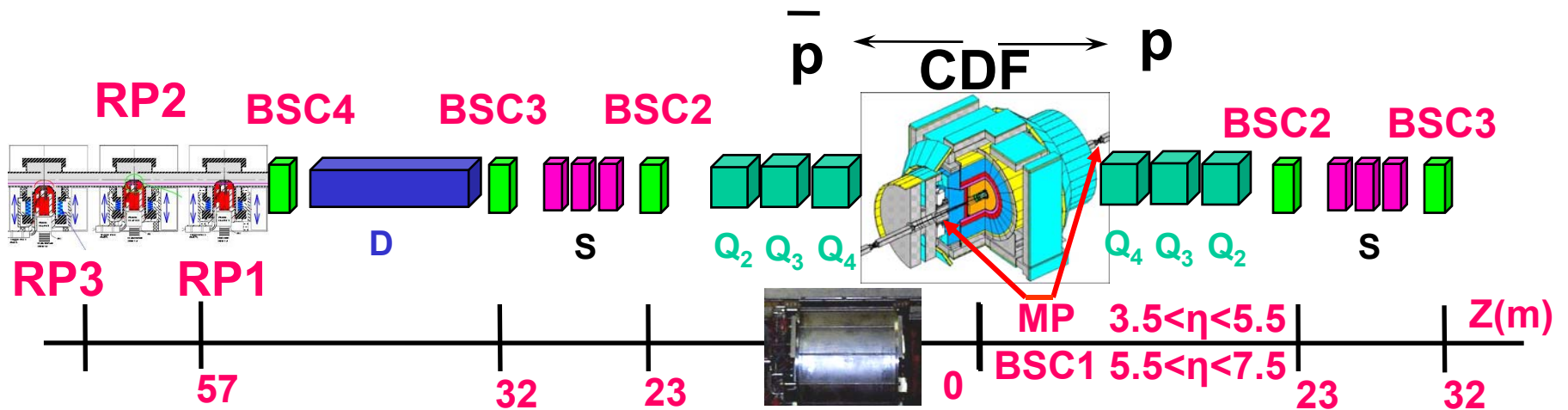
The forward Detectors of CDF and D0

Konstantin Goulios
The Rockefeller University

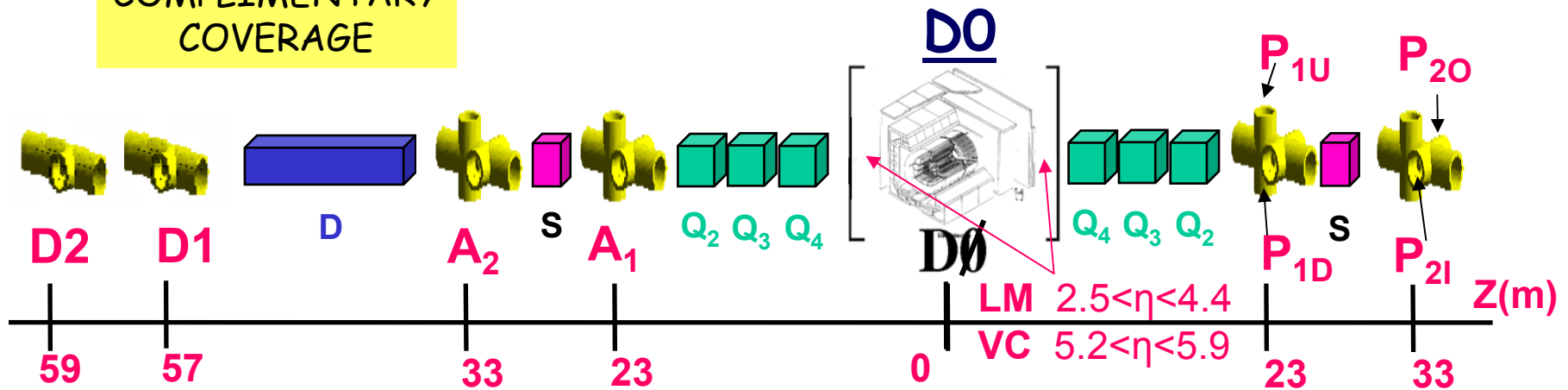


**13th International Conference on Elastic & Diffractive Scattering
(13th "Blois Workshop")**
CERN, 29th June - 3rd July 2009

CDF & D0 - Run II

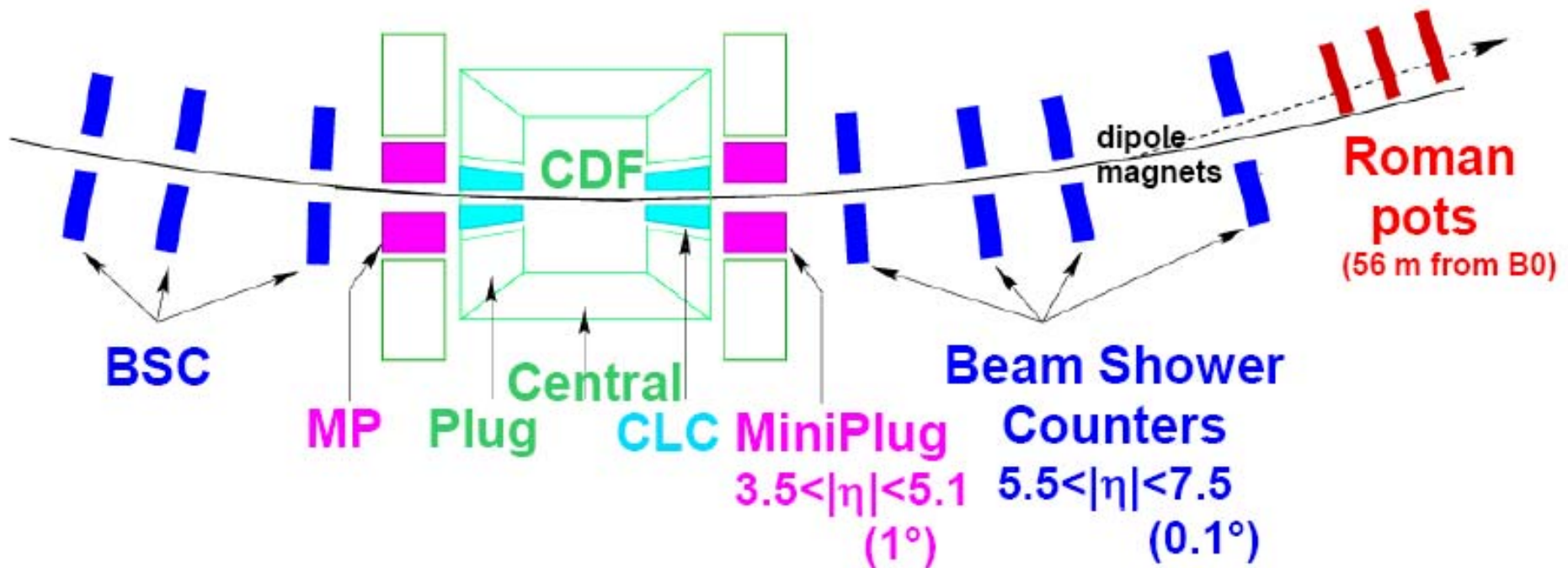


CDF & D0
COMPLIMENTARY
COVERAGE



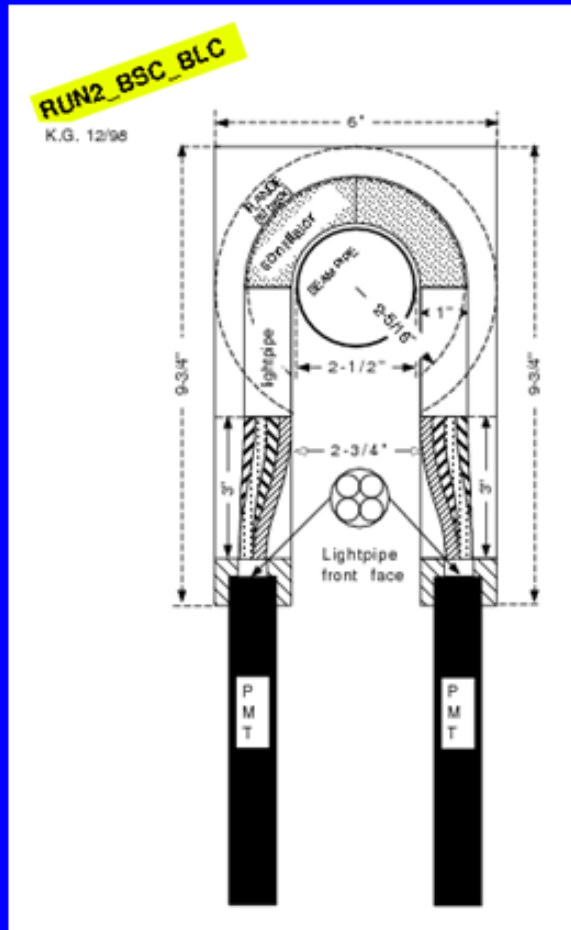
From Barreto's talk in small-x

The Forward Detectors of CDF



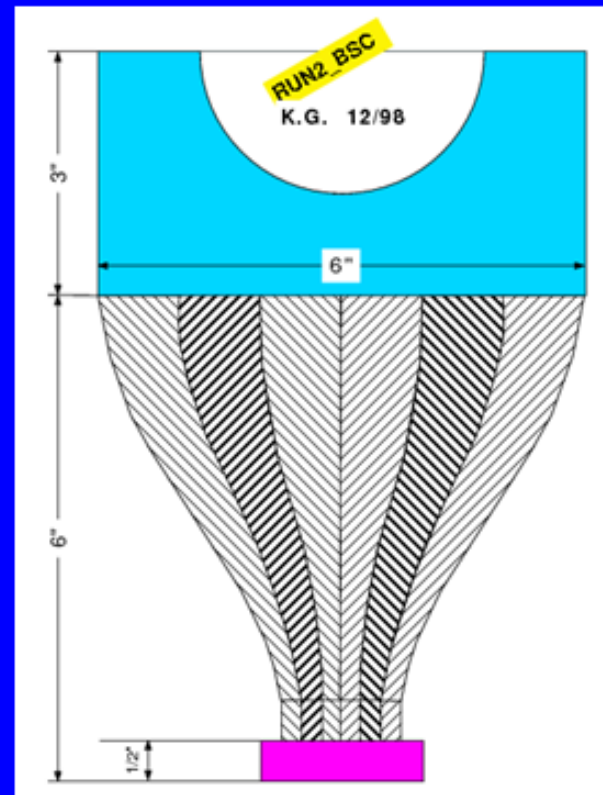
BSC: Beam Shower Counters

BSC1: 2 x 2 PMT's each side
2 Xo Pb in front for π^0

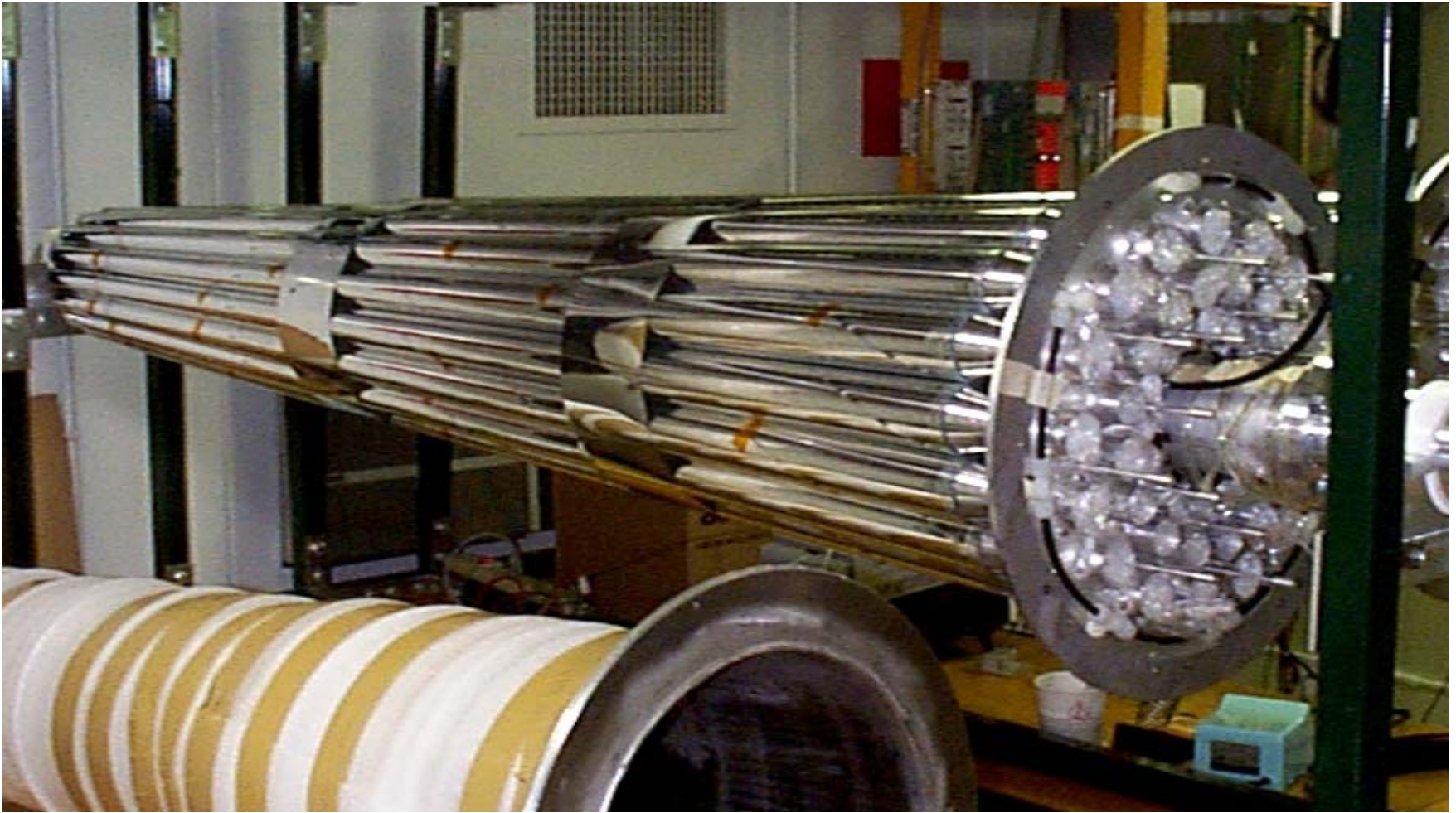


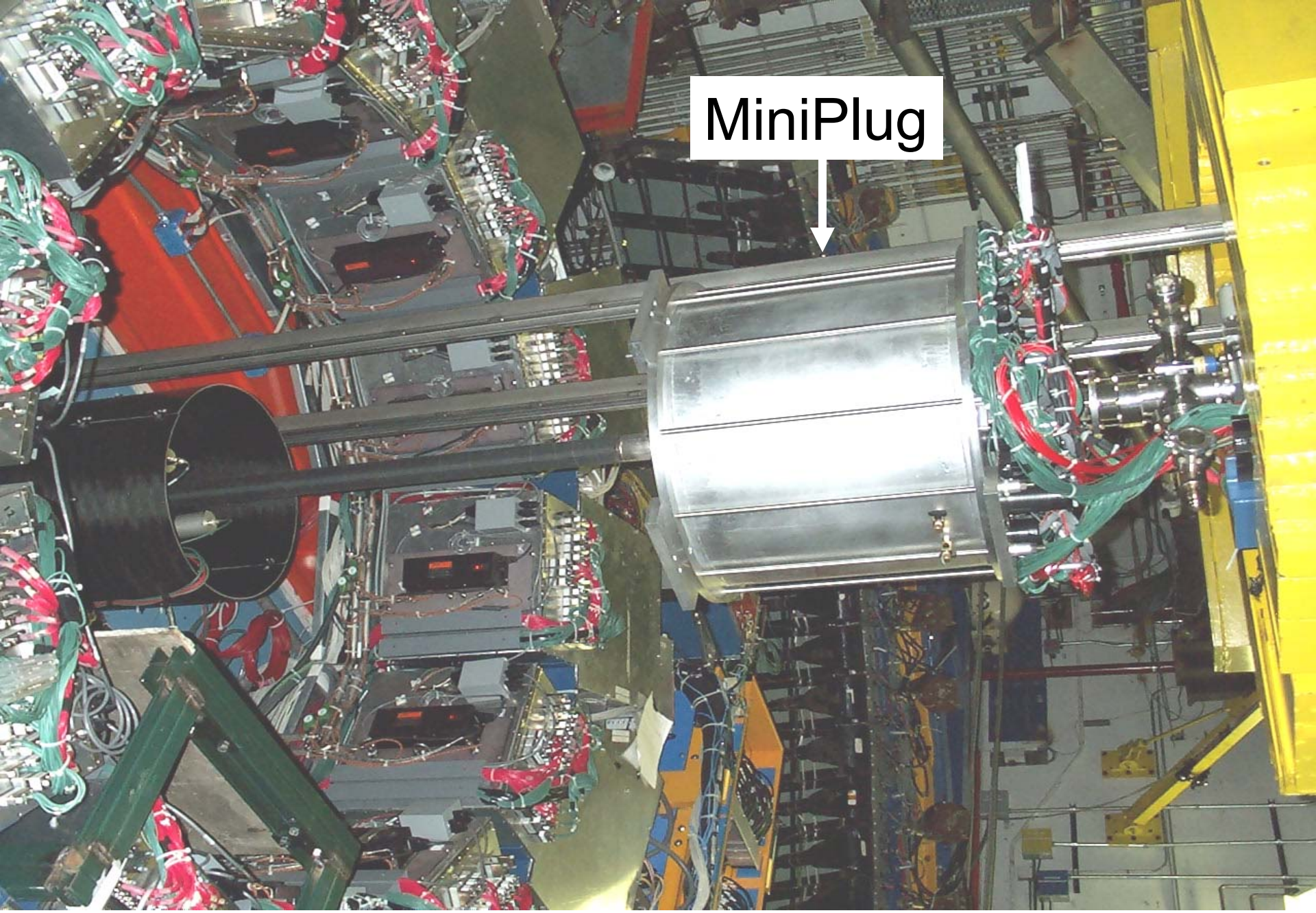
In CDF: Simple "BSC" counters
along pipes:

BSC2,3,4 out to $|\eta| = 7.4$ (55m)



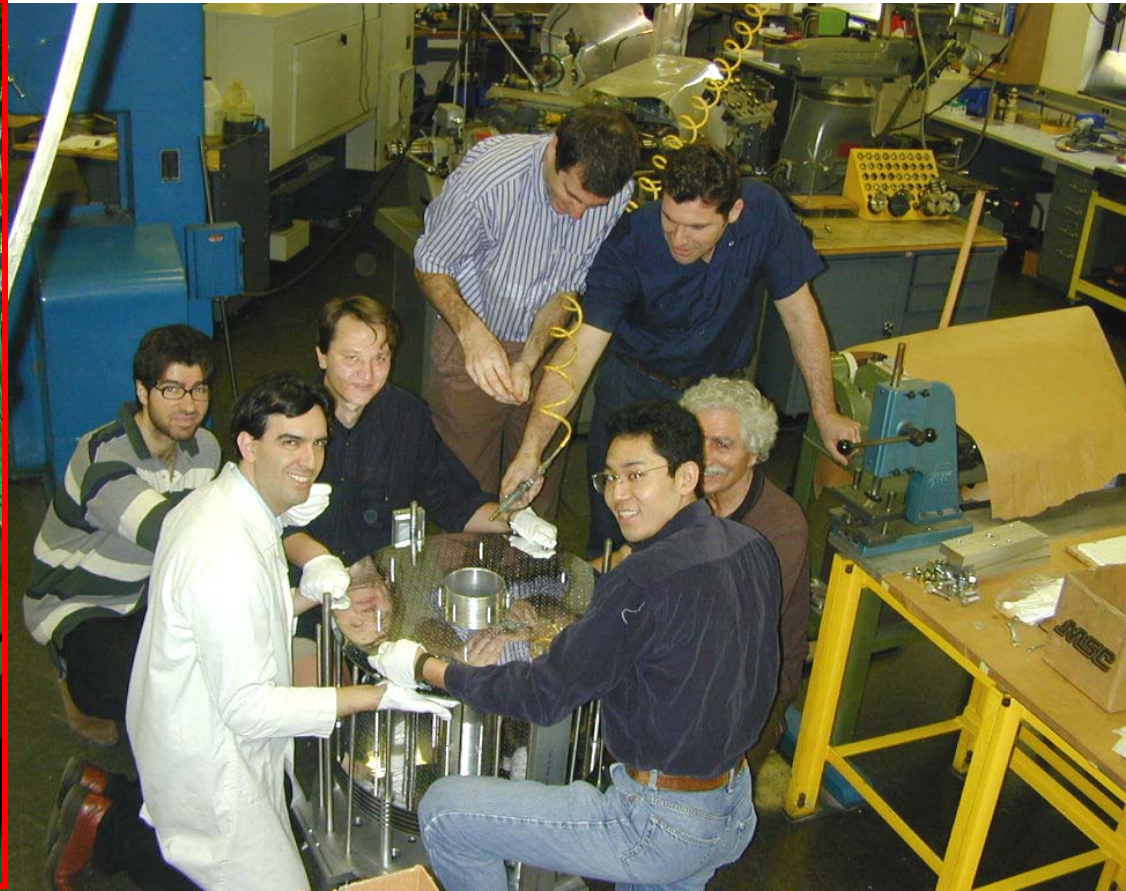
CLC: Cerenkov Luminosity Counters





MiniPlug

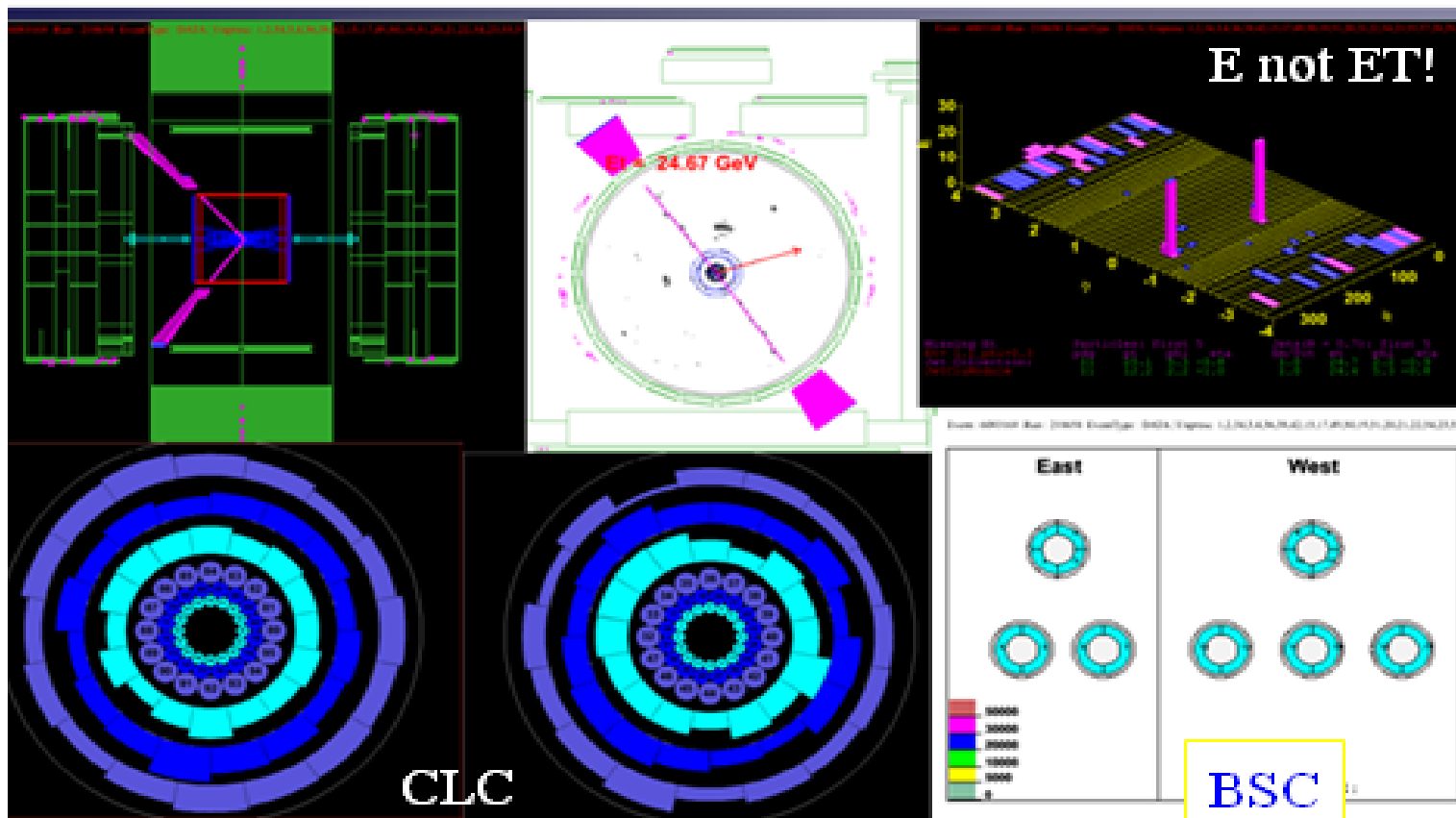
MiniPlug Construction



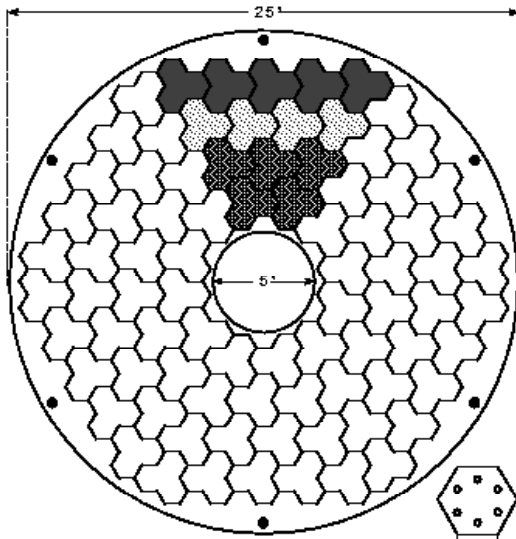
About 1500 wavelength shifting fibers of 1 mm dia. are 'strung' through holes drilled in $36 \times \frac{1}{4}$ " lead plates sandwiched between reflective Al sheets and guided into bunches to be viewed individually by multi-channel photomultipliers.

An Exclusive e^+e^- Candidate

$M_{ee} = 50 \text{ GeV}$



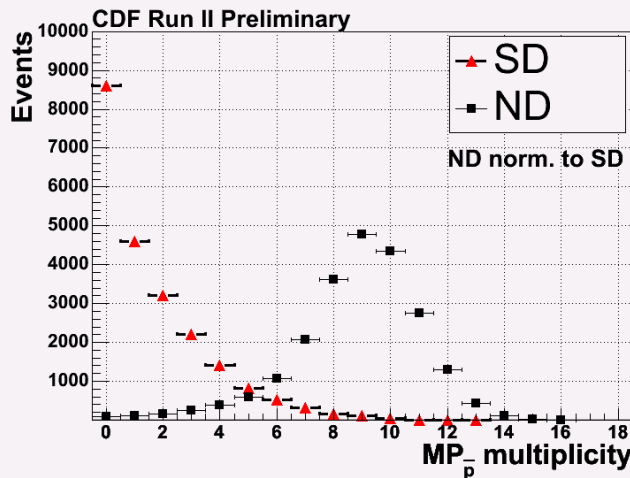
Measurements w/the MiniPlugs



← MP TOWER
STRUCTURE

MULTIPLICITY
→ @ POSITION

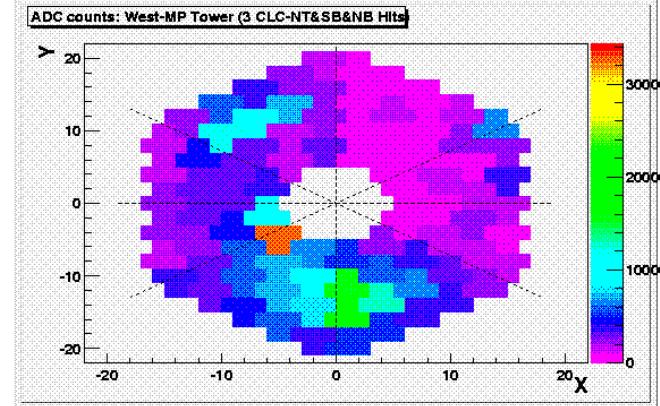
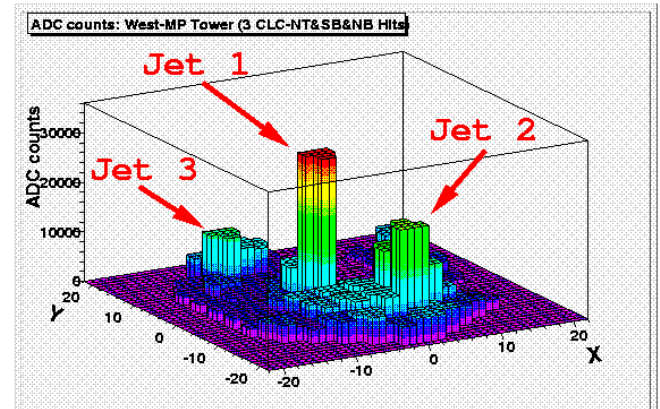
ENERGY
→



Multiplicity of SD and ND events

$$\xi_{CAL} = \frac{\sum_i E_T^i e^{-\eta_i}}{\sqrt{s}}$$

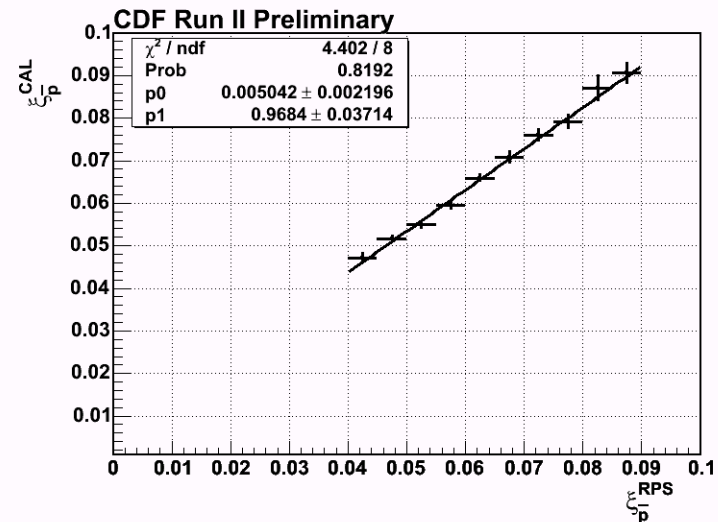
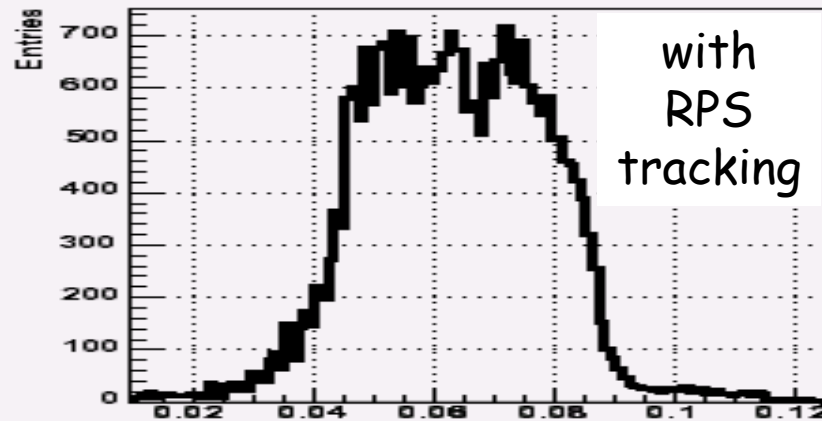
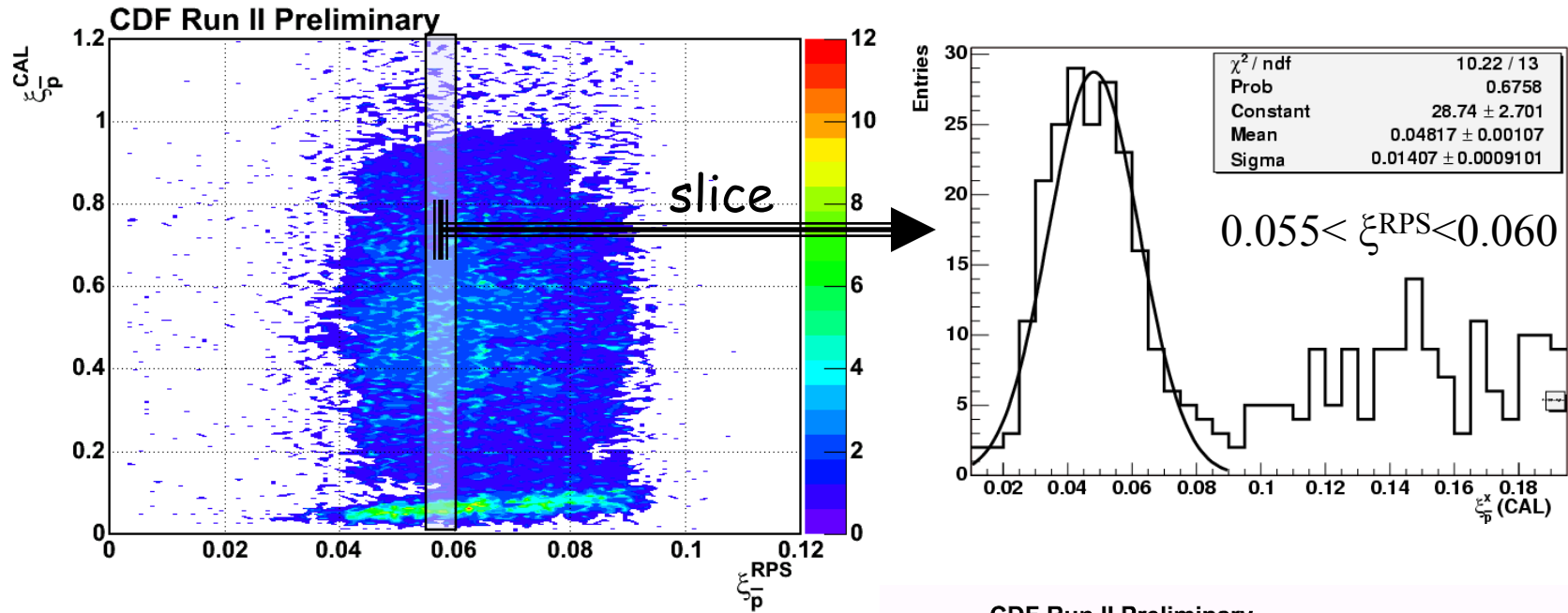
NIM A 430 (1999)
NIM A 496 (2003)
NIM A 518 (2004)



ADC counts in MiniPlug towers in a pbar-p event at 1960 GeV.

- “jet” indicates an energy cluster and may be just a hadron.
- 1000 counts ~ 1 GeV

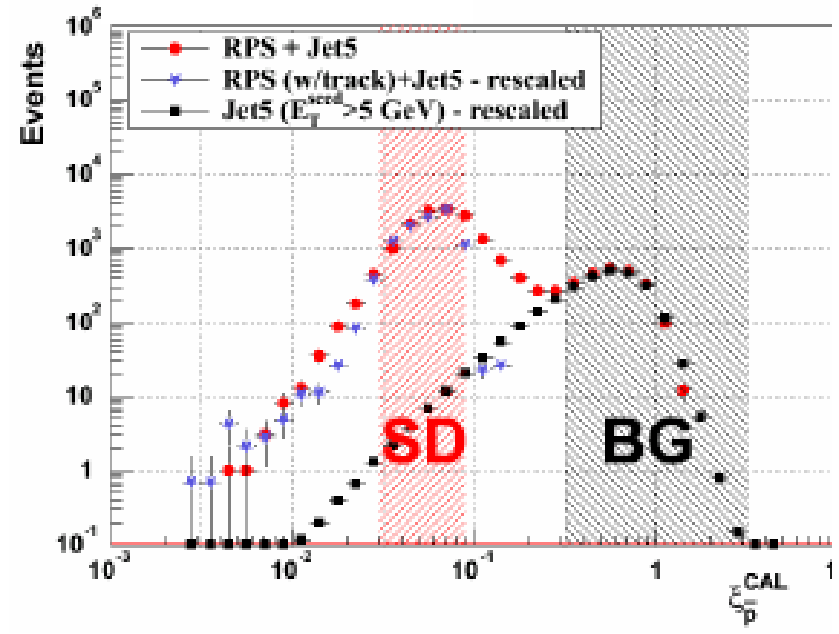
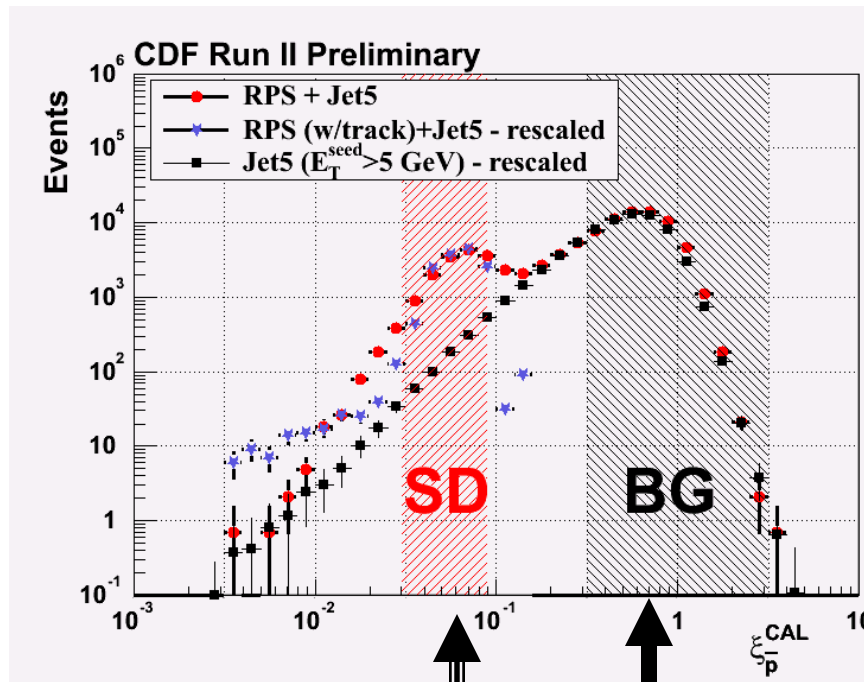
RPS Tracking Calibration



Diffractive Dijet Signal

2002-2003 data: $\langle \text{InstL} \rangle \sim 1.5E31$

Low InstLum $\sim 0.5E30$



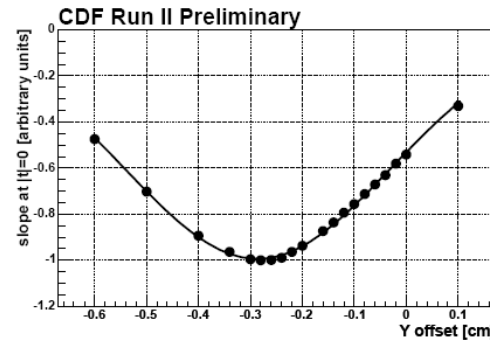
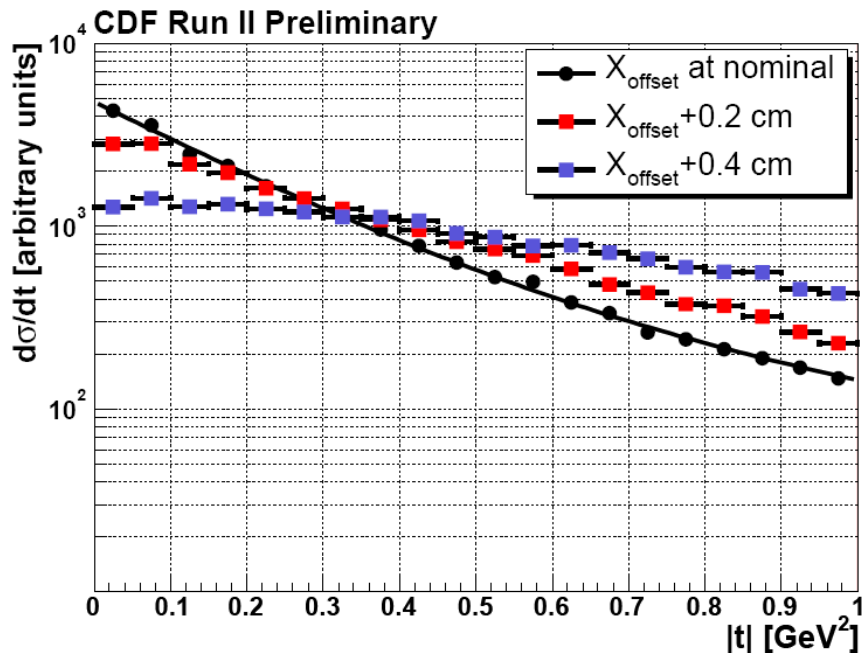
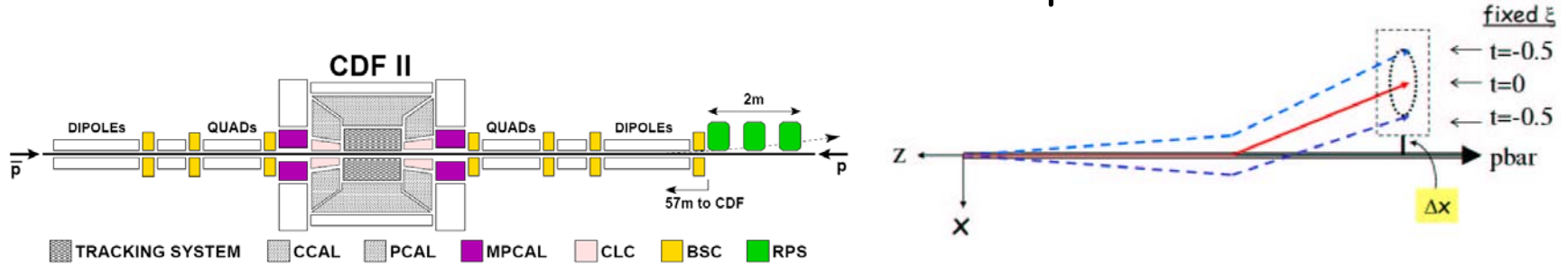
BG \rightarrow ND dijet + soft SD

$$\frac{d\sigma}{d\xi} \propto \frac{1}{\xi} \Rightarrow \frac{d\sigma}{d \log \xi} = \text{constant}$$

$$\xi^{\text{CAL}} = \frac{\sum_i E_T^i e^{-\eta_i}}{\sqrt{s}}$$

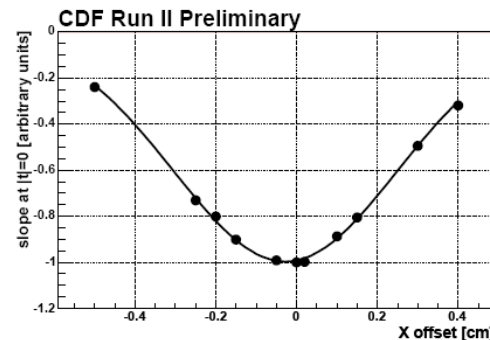
Dynamic Alignment of RPS Detectors

Method: iteratively adjust the RPS X and Y offsets from the nominal beam axis until a maximum in the b-slope is obtained @ $t=0$.



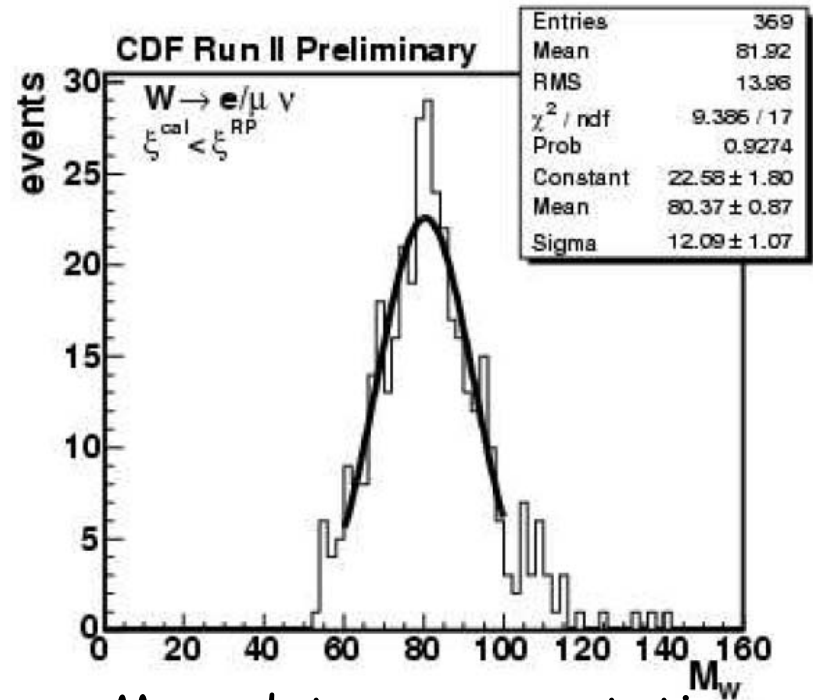
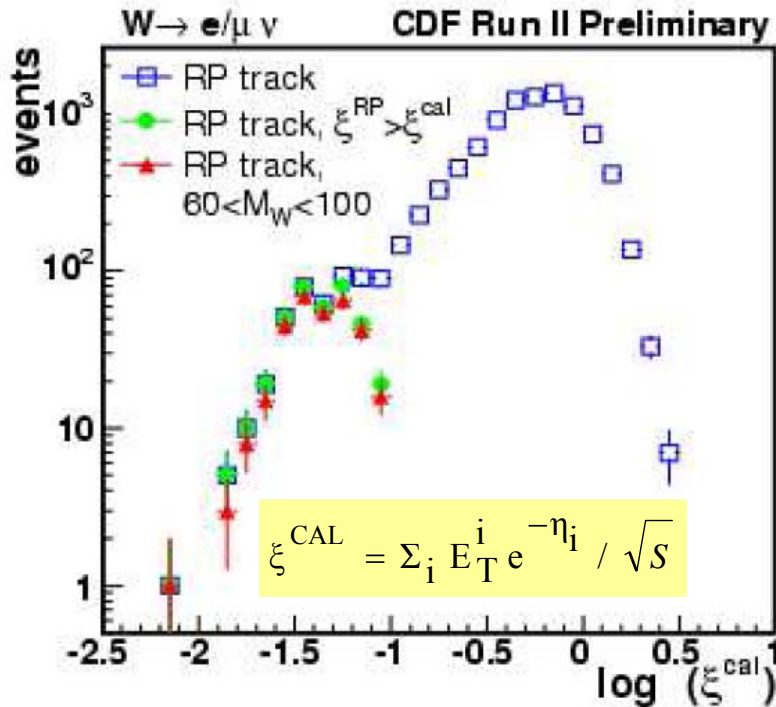
Limiting factors

- 1-statistics
- 2-beam size
- 3-beam jitter

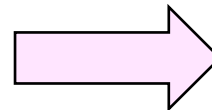


@ CDF
w/lowlum data
 $\pm 30 \mu\text{m}$

P_L Balance $\rightarrow M_W$



M_W - data vs. expectation



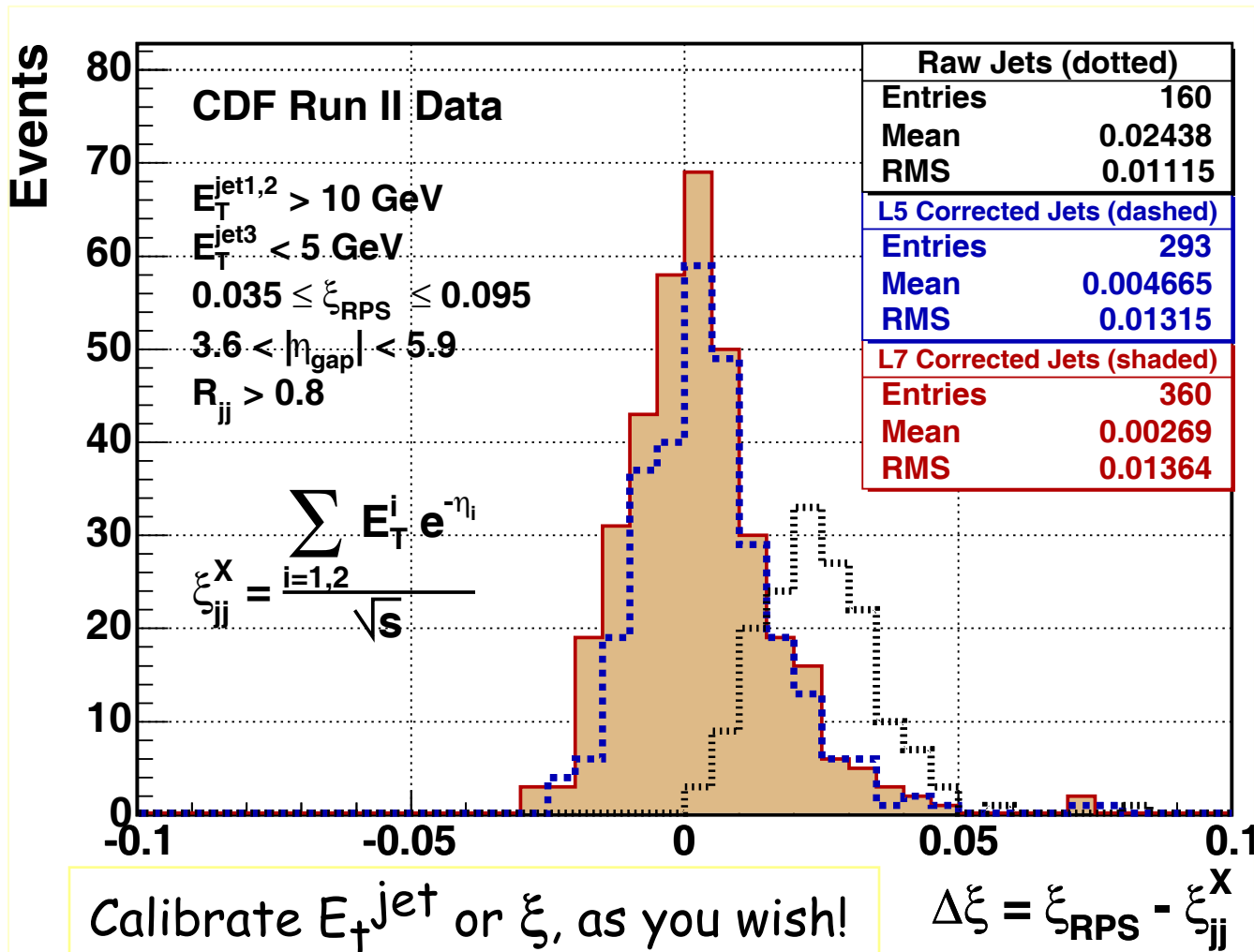
M_W

$$p_L^{\nu} = (1 - \xi) \times p_{\text{beam}} - \sum_{\text{cal}} p_L$$

$$p_T^{\nu} = \text{missing } E_T$$

E_T^{jet} Calibration

→ use RPS information to check jet energy corrections ←





thank you