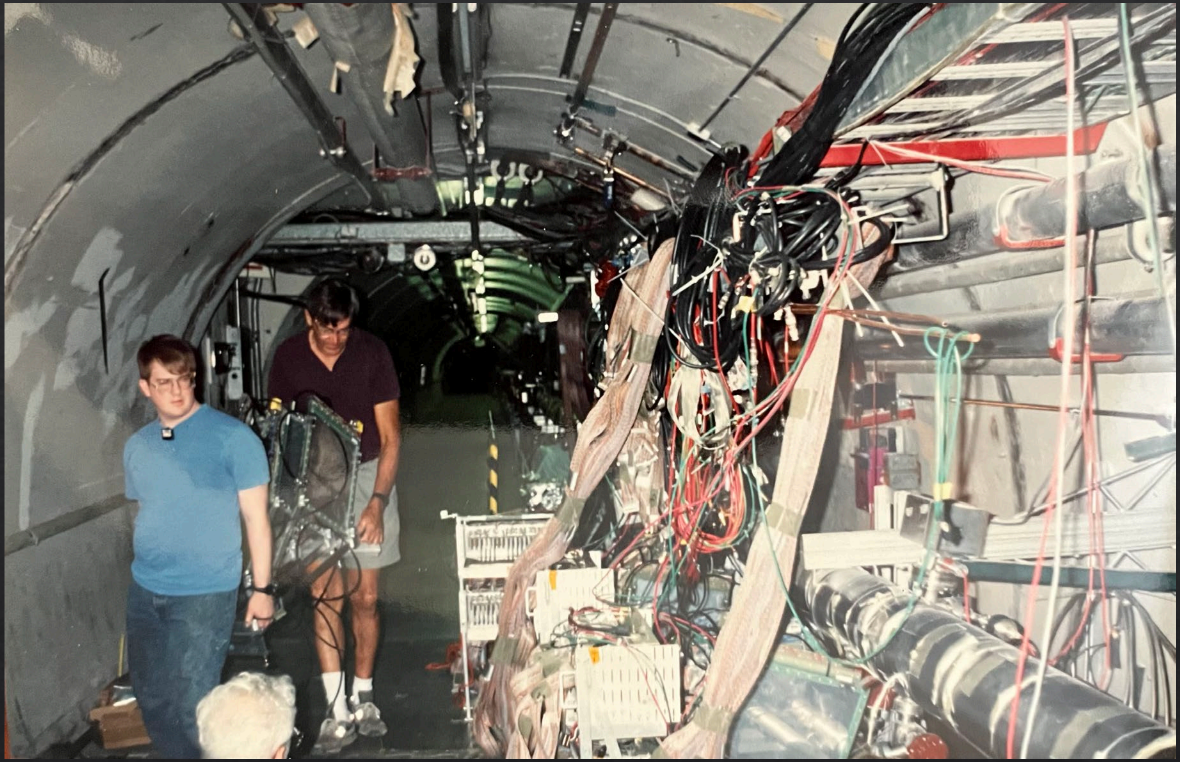
Bj the Experimenter



Cyrus C. Taylor
Remembering Bj Symposium, SLAC
November 9, 2024

J. BJORKEN
ASPEN
SEPT '93

MINIMAX: MULTIPARTICLE PHYSICS AT THE TEVATRON COLLIDER

I. PREHISTORY: THE FAD INITIATIVE

II. FROM FAD TO MAX TO MINIMAX

III. MINIMAX DETECTOR STATUS

IV. MINIMAX PHYSICS GOALS

1. DISORIENTED CHIRAL CONDENSATE
2. INTERMITTENCY

SLAC–PUB–5545
May 1991
T/E/I

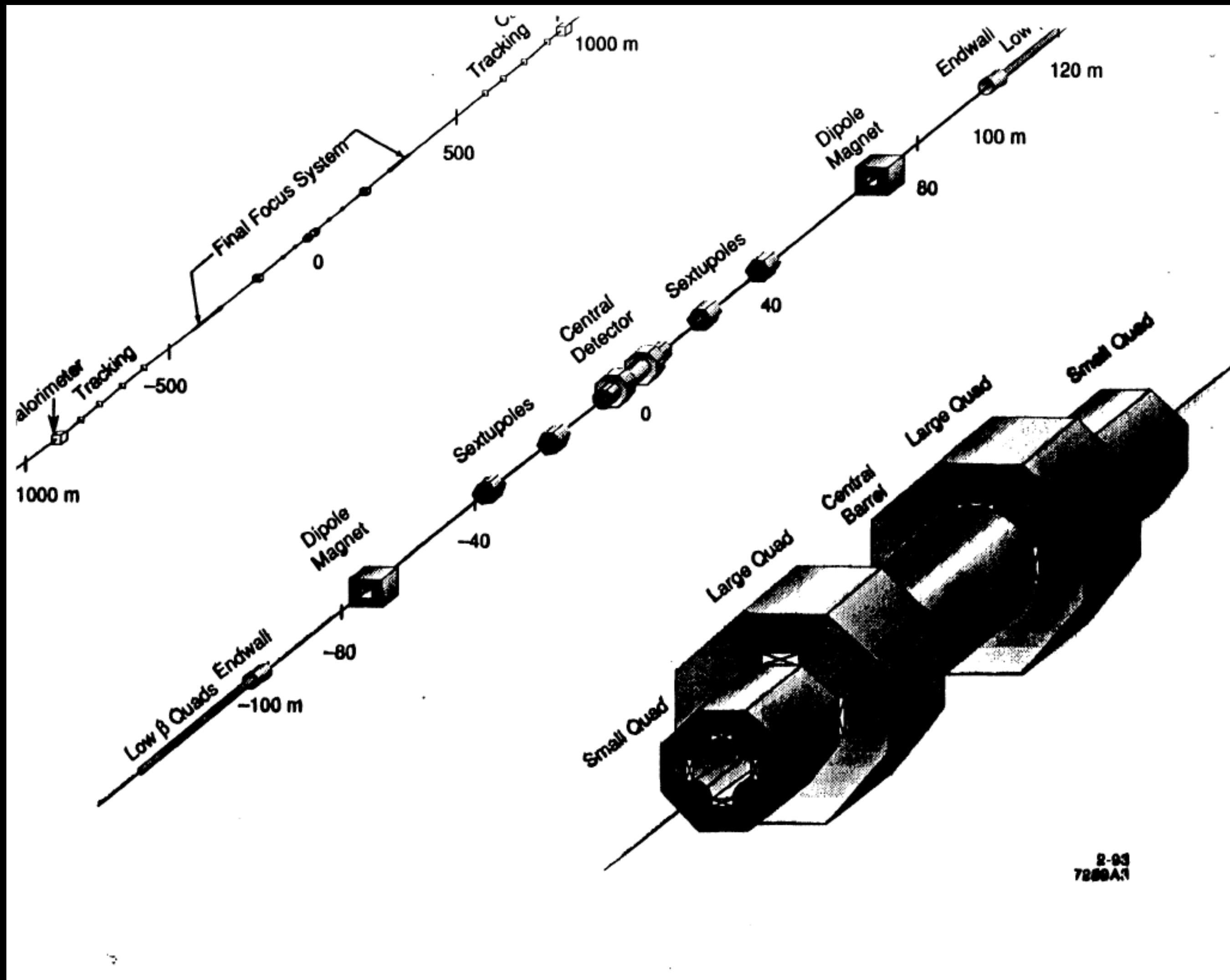
A Full-Acceptance Detector for SSC Physics at Low and Intermediate Mass Scales*

An Expression of Interest to the SSC

J. D. Bjorken
Stanford Linear Accelerator Center
Stanford University, Stanford, California 94309

* Work supported by the Department of Energy, contract DE–AC03–76SF00515.

(Submitted for Publication)


Tracking
1000 m
500
Final Focus System
0
–500
alorimeter
Tracking
1000 m
Endwall
Low
120 m
100 m
Dipole
Magnet
80
Sextupoles
40
Central
Detector
0
Sextupoles
–40
Dipole
Magnet
–80
Low β Quads
Endwall
–100 m
Small Quad
Large Quad
Central
Barrel
Large Quad
Small Quad
2-93

History

May 1991 — EOI-19 submitted to SSC Lab.

Aug 1991 — Encouragement from SSC/PAC

Dec 1991 — First meeting of FAD working group (now ≳ 100 members)

July 1992 — Workshop in Boulder, CO; ~30 participants for 1 week

Since then:

Gestation - period

cct starts working with Bj on DCCs

Cosmic Ray Symposium, Ann Arbor, June 1992

FROM FAD TO MAX TO MINIMAX

Sept 92 Proposal P864 to Fermilab: MAX
(Bjorken, Longo et. al.)
Physics: 1. Discover Hard Diffraction
2. Search for Disoriented Chiral Condensate

March 93 P864 rejected

April 93 New proposal T864 for test (minimax) submitted
(Bjorken, Taylor, et. al.).
Physics: Search for disoriented chiral condensate.

May 93 Approval in principle by director
July 93 MOU signed.
Sept 93 Apparatus being installed.

September 1, 1992

Maximum Acceptance Detector for the Fermilab Collider (MAX)

Y. T. Gao, H. R. Gustafson, L. W. Jones, M. J. Longo*
University of Michigan

J. D. Bjorken*, G. Niemi, M. L. Perl
Stanford Linear Accelerator Center

P. Colestock, B. Hanna
Fermi National Accelerator Laboratory

J. Iwai, S. Strausz
University of Washington

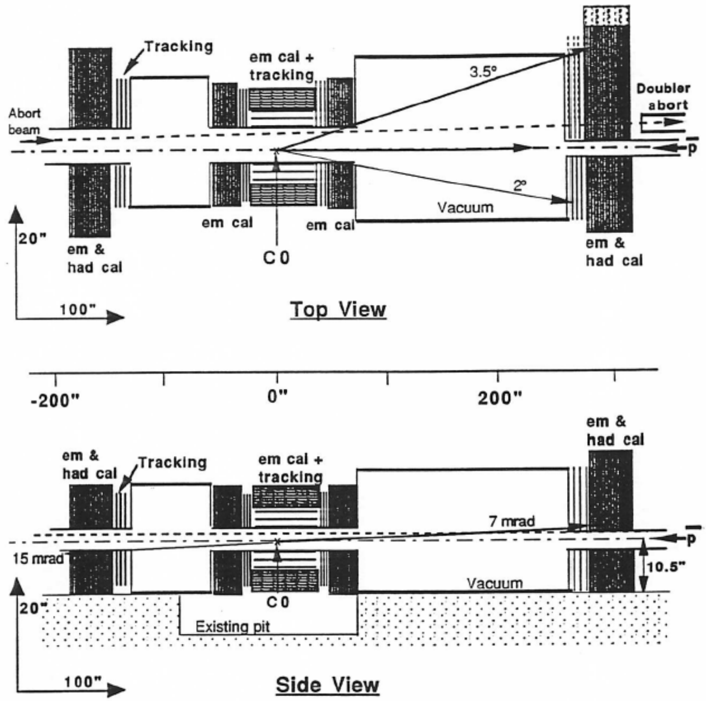
S. H. Oh, W. D. Walker
Duke University

K. L. Kowalski, C. C. Taylor
Case Western Reserve University

*Co-spokesmen—
BJORKEN@SLACVM, (415)926-2266
MICH::LONGO, (313)764-4445

12/4/92

MAX Phase I Detector for C0



NOTES:

- Transverse dimensions exaggerated X5.
- All calorimeters except 2 outermost are em only.
- Tracking chambers precede all calorimeters.
- Asymmetry is forced by the need to accommodate the abort beam.
- Part of cal at +300" is normally withdrawn to enable abort beam.
- Barrel and inner cals cover approx. same angular range as CDF & D0
- Possible passive absorber downstream of inner cals not shown.
- Trigger/timing scintillation counters not shown.

FROM FAD TO MAX TO MINIMAX

Sept 92 Proposal P864 to Fermilab : MAX
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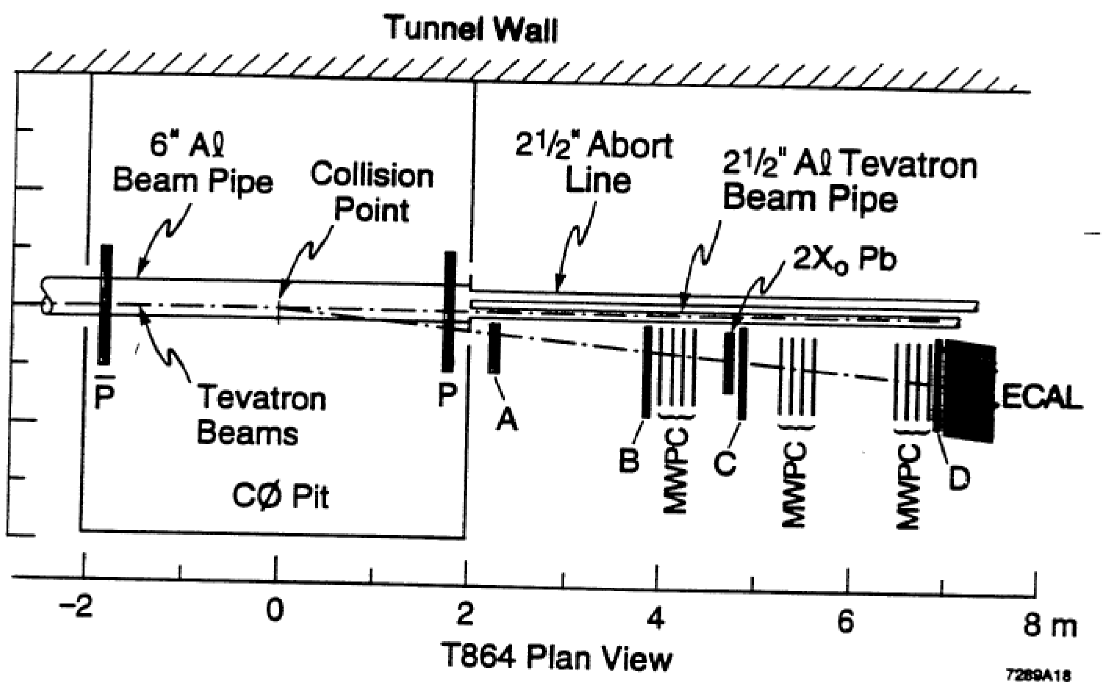

(P, P̄, A, B, C, D) : SCINTILLATOR TRIGGERS

: ELECTROMAGNETIC CALORIMETER
(30X° LEAD-SCINTILLATOR)

April 1993

MiniMax: A Revised Proposal for T-864

J. D. Bjorken*

Stanford Linear Accelerator Center
Stanford University, Stanford, California 94305

S. H. Oh and W. D. Walker

Department of Physics, Duke University
Durham, North Carolina 27706

W. J. Fickinger, T. L. Jenkins, K. L. Kowalski and C. C. Taylor*

Department of Physics, Case Western Reserve University
Cleveland, Ohio 44106

S. Strausz

Department of Physics, University of Washington
Seattle, Washington 98195

P. Colestock and B. Hanna

Fermi National Accelerator Laboratory
Batavia, Illinois 60510

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* Co-Spokesmen

Fermilab

Fermi National Accelerator Laboratory
P.O.Box 500 • Batavia, Illinois • 60510
708-840-3211 FTS 370-3211

Director's Office

Post-It™ brand fax transmittal memo 7671	# of pages ▸ 1
To Prof. C.C. Taylor	From Taiji Yamanouchi
Co.	Co. Fermilab
Dept.	Phone # 708-840-3211
Fax # 216-369-4671	Fax # 708-840-2939

May 24, 1993

Dr. James D. Bjorken
SLAC
P.O. Box 4349
Stanford, California 94309

Dear Bj,

I have decided to approve, in principle, your request to conduct a test as described in your MiniMax proposal (P-864). The approval applies only to Stage I (Single-Arm Running). A final decision to proceed will await completion of a Memorandum of Understanding (MOU). I will ask Carlos Hojvat to work with you to prepare a draft MOU. Since the Laboratory is under extremely tight financial constraints and there is a severe shortage of technical manpower, I expect you to provide most of the financial and manpower support. I should also point out that there will be a large amount of activity in the Main Ring tunnel during the upcoming shutdown period and we will have to work with a very tight schedule. Therefore, you should minimize the effort that will be required for the installation of your detector components in the tunnel.

If we can arrive at a complete understanding of resources by means of the MOU and these require a minimum of Laboratory effort, we will proceed.

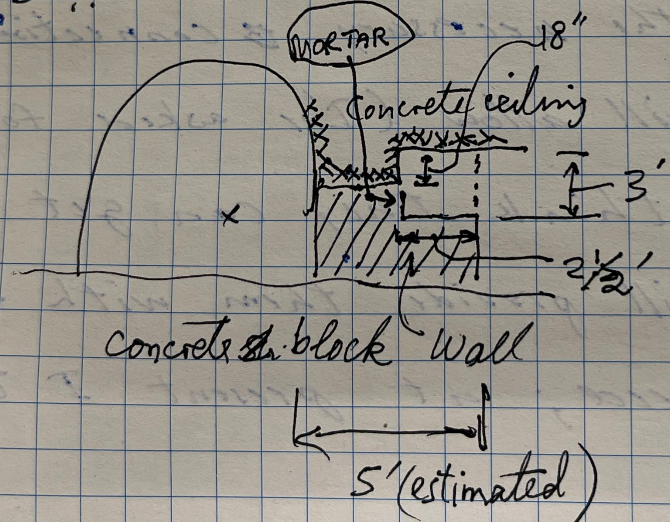
Sincerely,

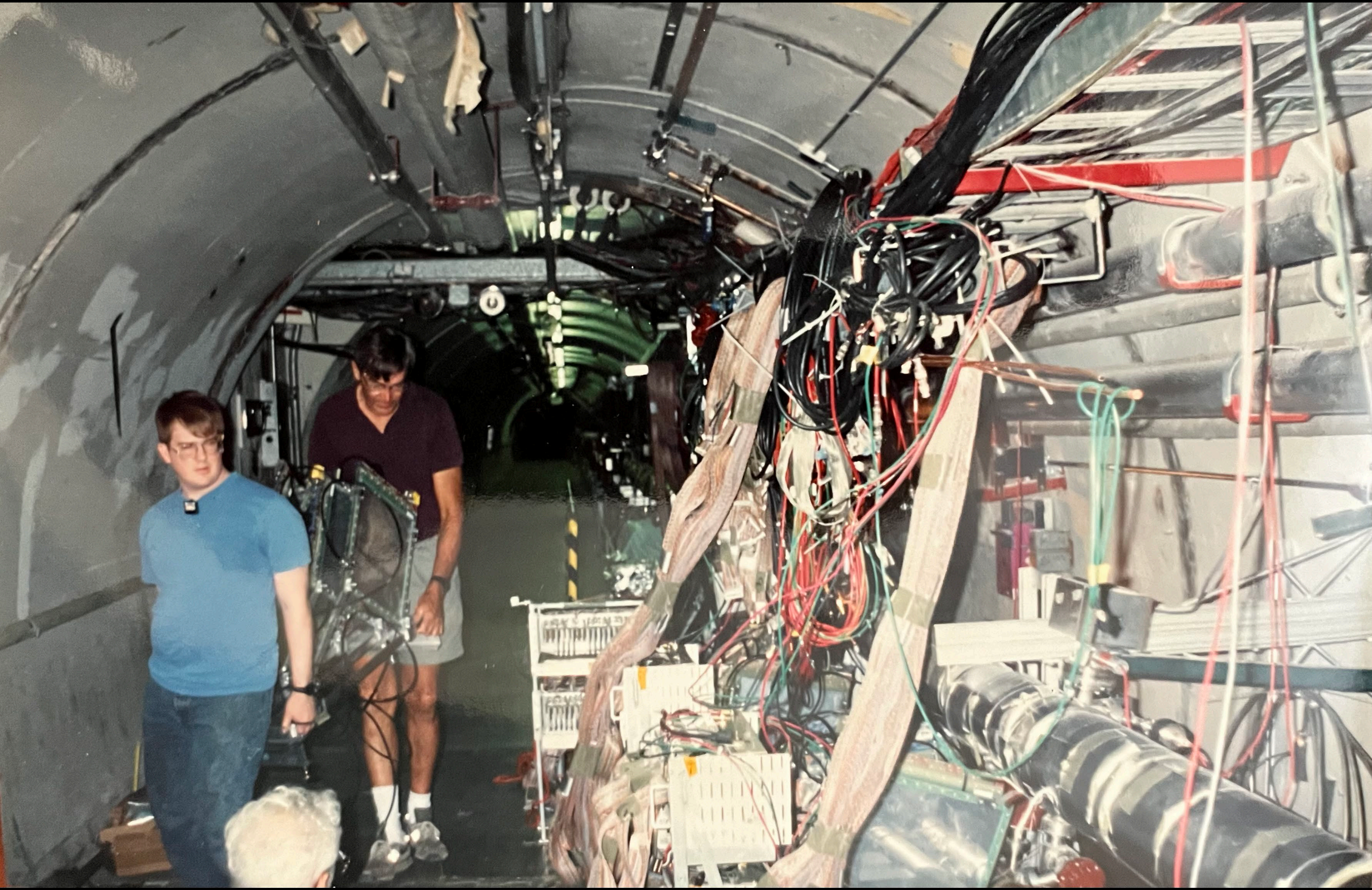
John Peoples

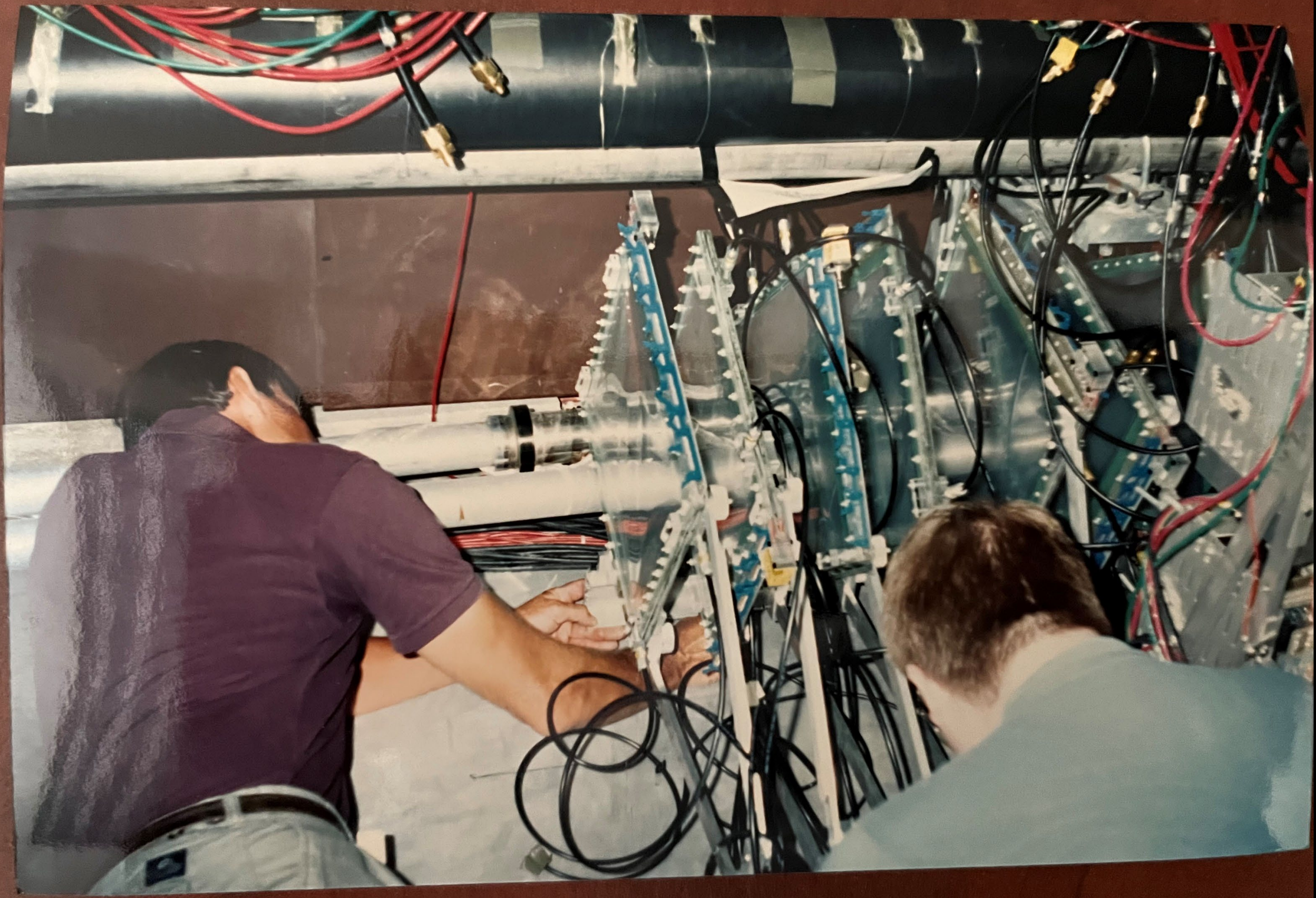
cc: K. C. Stanfield
S. Holmes
R. Dixon
T. Nash

7/21 bj & BH in spectrometer room:

Top of shielding wall removed. 5' x 3' x 2½' deep removed in 1 hr 10 min (0.5 cu ft/min). MORTAR SIGHTED!!







What next?

Starting October: Begin running detector (Beam-gas only)

Maybe by next spring: Small amount of beam-beam running if things go smoothly.

Shutdown next spring, summer?? Augment, modify the apparatus.

Late 1994 ?? Dedicated 2 week collider run together with E811 (Orear) elastic scattering.

End of 1994 End of run and of exp't.

The New York Times

SUNDAY, OCTOBER 31, 1993

Stating Regret, Clinton Signs Bill That Kills Supercollider

WASHINGTON, Oct. 30 (AP) — Lamenting its death as "a serious loss" to science, President Clinton on Friday signed a bill killing the $11 billion superconducting supercollider project.

Mr. Clinton was forced to accept the termination of the Texas project when a budget-conscious Congress voted to abandon the program, which is one-fifth complete with a 14-mile-long underground tunnel and complex of laboratory buildings.

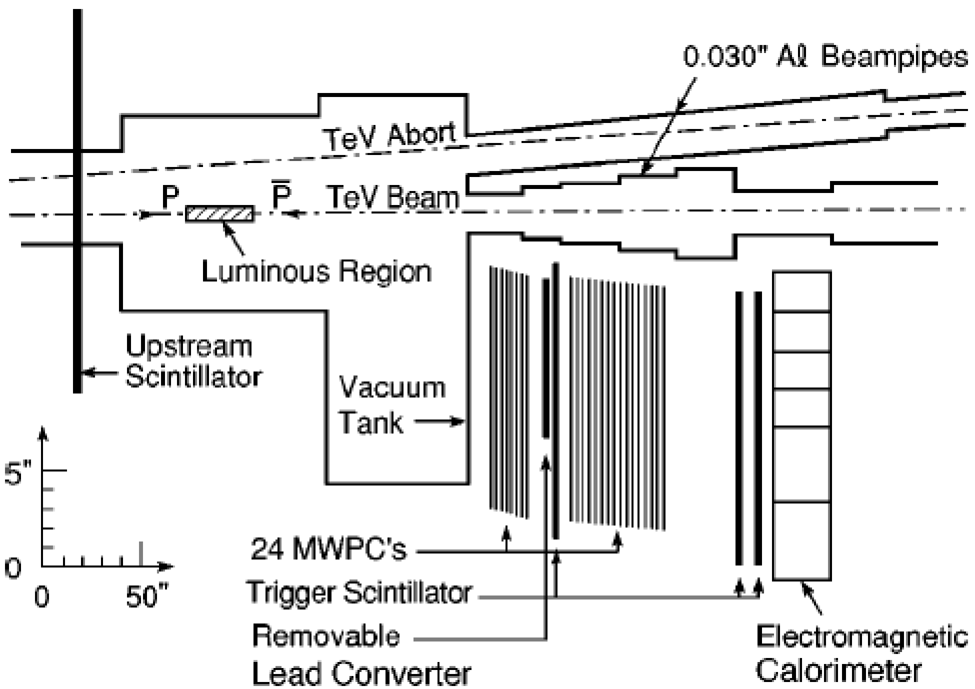
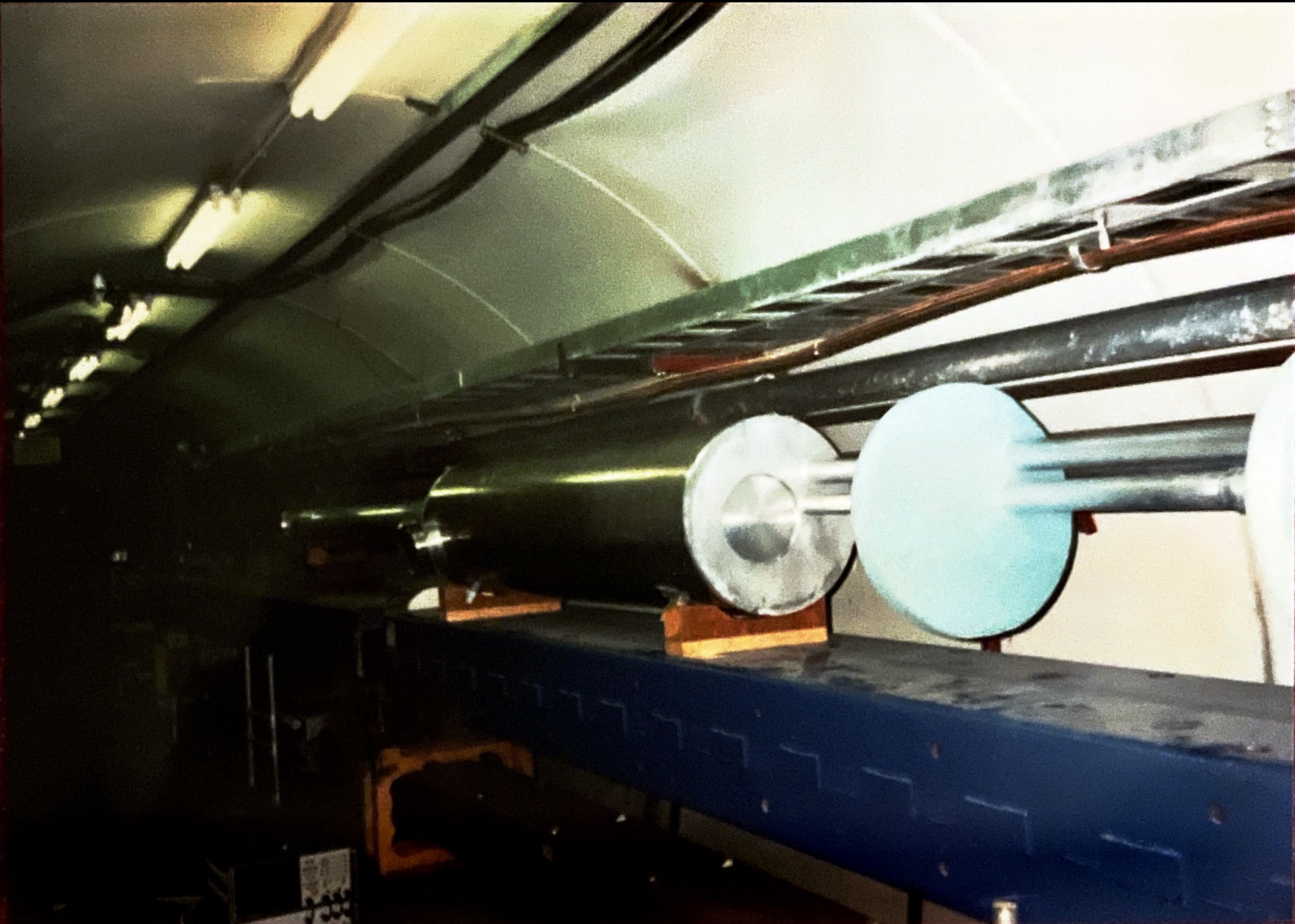
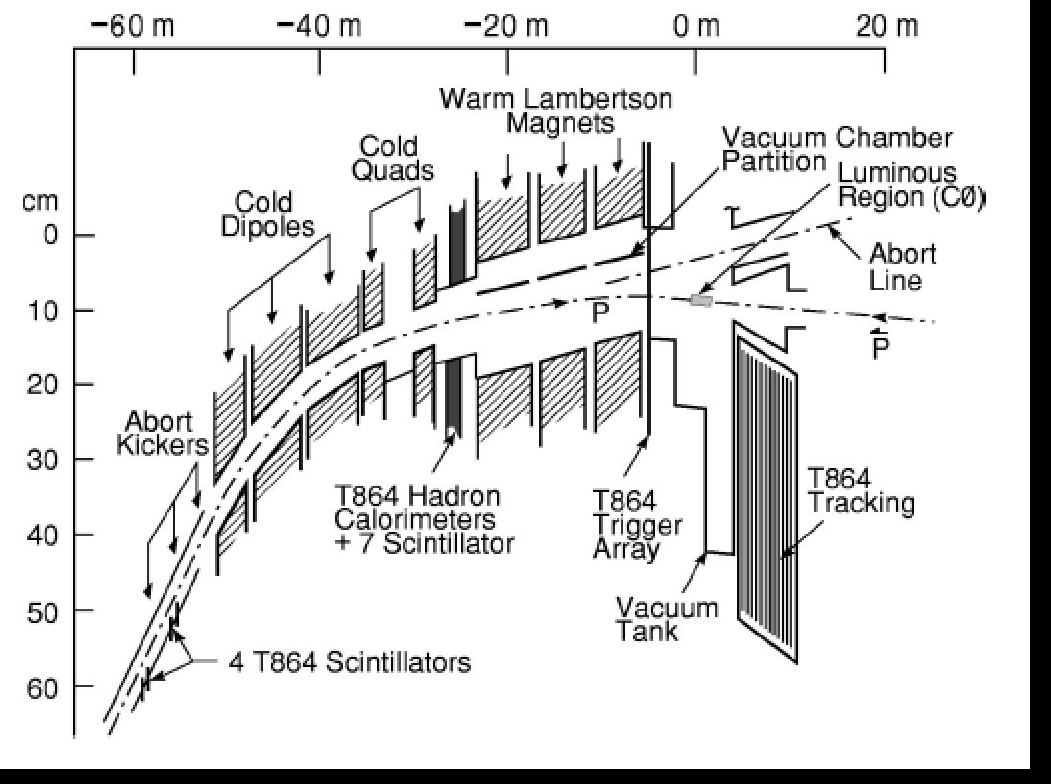


FIG. 1. Plan view of the final configuration of the MiniMax detector, illustrating the tracking detectors, the beam pipe architecture and the location of the trigger scintillator elements.





−60 m
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20 m
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30
40
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60
Warm Lambertson Magnets
Cold Quads
Cold Dipoles
Vacuum Chamber Partition
Luminous Region (C0)
Abort Line
P
P̄
Abort Kickers
T864 Hadron Calorimeters + 7 Scintillator
T864 Trigger Array
T864 Tracking
Vacuum Tank
4 T864 Scintillators

PHYSICAL REVIEW D VOLUME 55, NUMBER 9 1 MAY 1997

Analysis of charged-particle–photon correlations in hadronic multiparticle production

T. C. Brooks, M. E. Convery, W. L. Davis, K. W. Del Signore,* T. L. Jenkins, E. Kangas,† M. G. Knepley,‡ K. L. Kowalski, and C. C. Taylor
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A. Abashian and N. Morgan
Department of Physics, Virginia Polytechnic Institute, Blacksburg, Virginia 24061-0435

C. A. Pruneau
Department of Physics and Astronomy, Wayne State University, Detroit, Michigan 48202

(MiniMax Collaboration)
(Received 11 September 1996)

In order to analyze data on joint charged-particle–photon distributions from an experimental search (T-864, MiniMax) for disoriented chiral condensate (DCC) at the Fermilab Tevatron collider, we have identified robust observables, ratios of normalized bivariate factorial moments, with many desirable properties. These include insensitivity to many efficiency corrections and the details of the modeling of the primary pion production, and sensitivity to the production of DCC, as opposed to the generic, binomial-distribution partition of pions into charged and neutral species. The relevant formalism is developed and tested in Monte Carlo simulations of the MiniMax experimental conditions. [S0556-2821(97)05807-4]

PHYSICAL REVIEW D, VOLUME 61, 032003

Search for disoriented chiral condensate at the Fermilab Tevatron

T. C. Brooks,* M. E. Convery,† W. L. Davis, K. W. Del Signore,‡ T. L. Jenkins, E. Kangas,§ M. G. Knepley,‖
K. L. Kowalski, and C. C. Taylor
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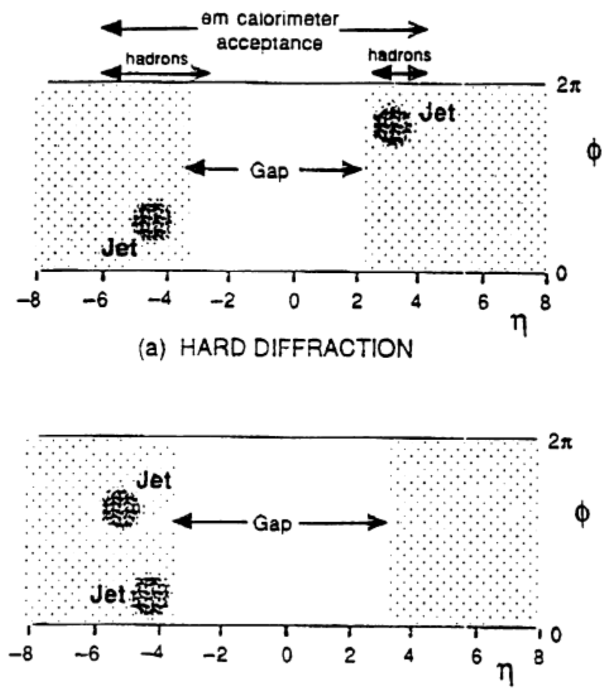
C. A. Pruneau
Department of Physics and Astronomy, Wayne State University, Detroit, Michigan 48202
(Received 16 June 1999; published 10 January 2000)

We present results from MiniMax (Fermilab T-864), a small test/experiment at the Fermilab Tevatron designed to search for the production of a disoriented chiral condensate (DCC) in p-$\bar{p}$ collisions at $\sqrt{s}=1.8$ TeV in the forward direction, $\sim 3.4<\eta<\sim 4.2$. Data, consisting of 1.3×10^6 events, are analyzed using the robust observables developed in an earlier paper. The results are consistent with generic, binomial-distribution partition of pions into charged and neutral species. Limits on DCC production in various models are presented.


5 15:48


The Standard Mod
at 50 Yea
3x2x1
50!
June 1-4, 2018
Cleveland

Bj, CCT, Dick Gustafson during MiniMax decommissioning



(a) HARD DIFFRACTION

(b) POMERON STRUCTURE FUNCTION (Ingelman-Schlein)

Figure 1—

(a) Hard diffraction dissociation process in which each projectile dissociates into a massive final state, a large amount of transverse momentum is exchanged between the projectiles, and a rapidity gap exists in the final-state phase space. The shaded regions correspond to secondary particle production with normal density. The calorimeter acceptance shown is that for the sample F0 detector illustrated in Fig. 4.

(b) Two-jet event due to the process suggested by Ingelman and Schlein which shows a rapidity gap aside, not between the two jets.

Binomial and DCC neutral fraction distributions

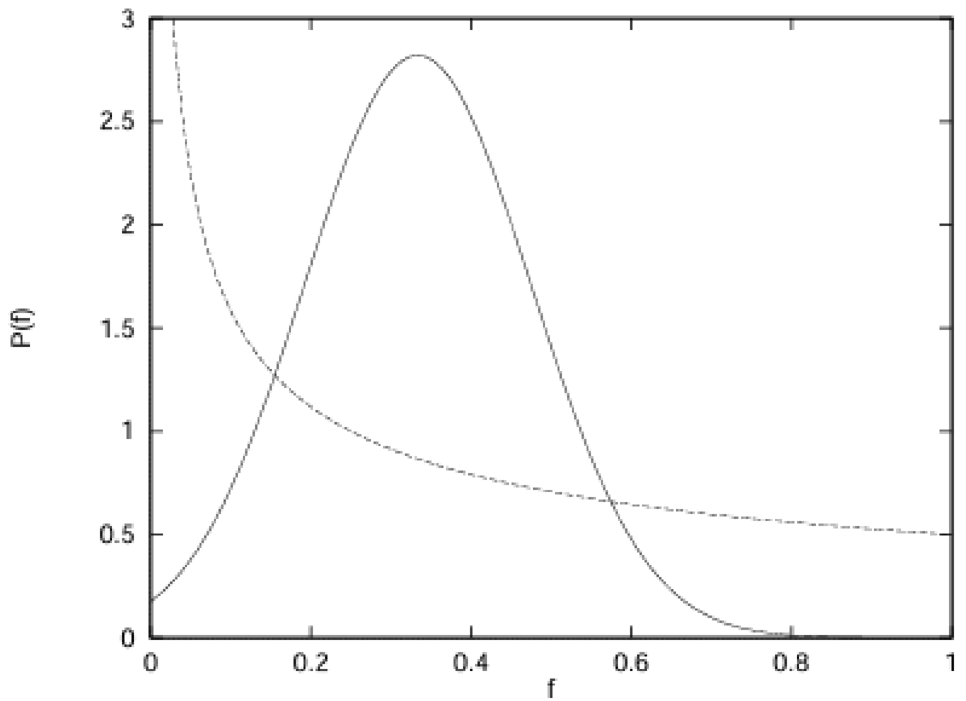


Figure 1.1: Binomial and DCC neutral fraction distributions.

(from Mary Convery PhD thesis, 1997)

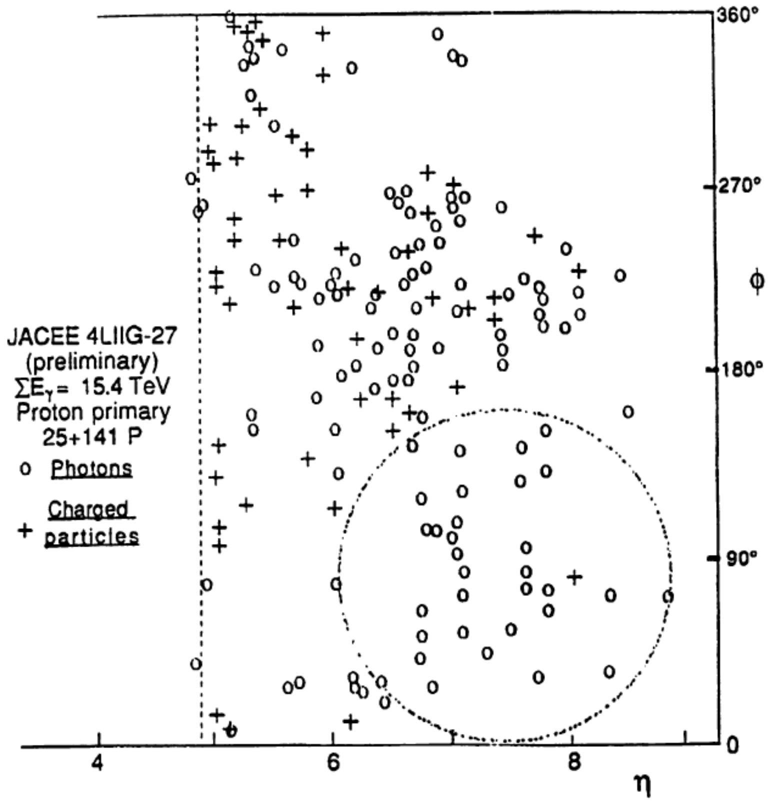


Figure 2—JACEE event showing the leading particle region $\eta > 6.5$. At lower rapidities the photon detection efficiency becomes small. The leading cluster, indicated by the circle, consists of about 32 γs with only one accompanying charged particle.