Fermilab Today

Thursday, September 23, 2004

Calendar

Thursday, September 23

2:30 p.m. Theoretical Physics Seminar - Curia II

Speaker: K. Agashe, Johns Hopkins University

Title: B-Factory Signals for a Warped Extra Dimension

3:30 p.m. DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over

4:00 p.m. Accelerator Physics and Technology Seminar - 1 West

Speaker: M. Huening, Fermilab

Title: Polarized Electron Beams from an RF-Gun: Problems and Prospects

Friday, September 24

3:30 p.m. Wine & Cheese - 2nd Flr X-Over

4:00 p.m. Joint Experimental Theoretical Physics Seminar - 1 West

Speakers: S. Holmes and S. Mishra, Fermilab

Title: Linear Collider R&D: Fermilab Plans

8:00 p.m. Fermilab Film Series - Auditorium

Title: O Brother, Where Art Thou?

Tickets: $4.00

Wilson Hall Cafe

Thursday, September 23

Minnesota Wild Rice with Chicken

Tuna Melt on Nine Grain $4.75

Breaded Veal with Mushroom Cream Sauce $3.75

Sweet & Sour Pork over Rice $3.75 BLT Ranch Wrap $4.75

Cheesey Breadsticks $2.25

Toasted Pecan Chicken Salad $4.75

Wilson Hall Cafe Menu

Chez Leon

Shutdown News

Maximizing Production In Antiproton Source

The Injection Region at the Antiproton Source, where newly-made antiprotons are brought to the Debuncher and merged with circulating antiprotons. (Click on image for larger version.)

Antiprotons drive the discovery process at Fermilab's Tevatron collider. But they're hard to make: for every million hits of protons on a metal target, only about 18-20 antiprotons ("Pbars") result.

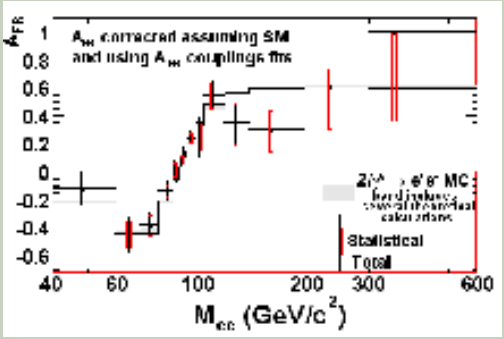
Shutdown efforts in the Antiproton Source are focused on three key areas, aimed at maximizing Pbar flow into and around the Debuncher ring: the Injection Region, where Pbars are brought to the Debuncher; the installation of motorized quadrupole stands to improve orbit control and aperture in the Debuncher; and alignment at the target area.

"Historically, the Injection Region is a known restriction," said David Vander

Meulen, who has oversight responsibility for overhauling the area, where new Pbars enter on an angle from above the Debuncher ring.

Fermilab Result of the Week

Testing the Standard Model with Z's and Photons



Measurement of the forward-backward asymmetry (A_{fb}) dependence on the invariant mass (M_{ee}) in Drell-Yan production decaying to electron-positron pairs. The A_{fb} at high mass gives clues to new physics, while the Afb at lower masses provides information about the Z couplings. (Click on image for larger version.)

The electroweak force has been tested to an unprecedented precision at recent e^+e^- collider experiments at LEP and SLC. At the Tevatron, the Z bosons and virtual photons are produced in quark anti-quark collisions, where they can decay to an electron-positron pair. The Tevatron can produce electron-positron pairs at higher invariant masses (M_{ee}) than those accessible by the e^+e^- colliders, and probe theories that predict new particles with high M_{ee}.

Interference effects predicted by the Standard Model should lead to an asymmetry in the angular distribution of the electrons relative to the incoming quarks. Depending on M_{ee}, the electron is more or less likely to travel in the direction of the quark. If an electron is found traveling within 90 of the direction of the incoming quark the event is called forward, otherwise it is called backward. A group from CDF has recently measured

Weather

Mostly Sunny 84º/61º

Extended Forecast

Weather at Fermilab

Current Security Status

Secon Level 3

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David Vander Meulen

Replacing magnets and beam tube, along with installing a motorized kicker stand, will increase aperture and allow more Pbars to enter the Debuncher. The changes will also provide more margin for tuning and decrease the area's sensitivity to beam drift. Where entering and circulating Pbars formerly used two beampipes, the barrier between them has been removed to create a common vacuum.

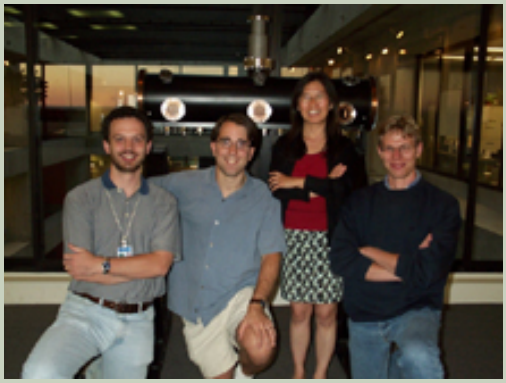
"We're probably 30 to 35 percent completed in the Injection Region," Vander Meulen said. "We've disassembled the old injection region, and we're starting assembly of the new components."

Also underway is the installation of motorized stands under 20 of the 114 Debuncher quadrupoles, allowing fine-tuning adjustments in the beampipe to keep the beam in the center and maximize the available circulating space. Ten magnets received such stands last year. The target area is also being surveyed to determine whether the incoming and outgoing beamlines are in precise head-on alignment; if they form an incorrect angle, precious antiprotons are lost coming off the target. A Pbar saved is a Pbar earned.

Fermilab Arts Series Presents Dr. Ralph Stanley & The Clinch Mountain Boys

the asymmetry between the number of forward and backward events (A_{fb}) as a function of M_{ee}.

The A_{fb} dependence at high M_{ee} is particularly interesting because the Standard Model predicts that it should have a constant value of about 0.6. An undiscovered particle could interfere with the Z and gamma production and modify A_{fb}. Any change from the constant value predicted by the Standard model would be very noticeable. With a dataset of 72 pb^{-1}, the results from CDF show good agreement with the Standard Model. The M_{ee} dependence of the A_{fb} measurement is also used to extract the Z-quark couplings and the Z-electron couplings for the first time at a hadron collider.


From left to right: Adam Gibson (Graduate student, U.C. Berkeley), Greg Veramendi (Postdoc, UIUC), and Young-Kee Kim (Professor, U. of Chicago) worked on the measurement of A_{fb}. Gilles De Lentdecker (Postdoc, U. of Rochester) worked on measuring the Z couplings. Greg Veramendi wrote his Ph.D. dissertation on this analysis for U.C. Berkeley.

Result of the Week Archive

Announcements

Ralph Stanley will be performing at Fermilab on September 25.

The Fermilab Arts Series will present Dr. Ralph Stanley & The Clinch Mountain Boys on Friday, September 25 at 8:00 p.m. in Ramsey Auditorium. Tickets are still available for this performance.

Born in 1927, Stanley has been playing professionally since he and his oldest brother, Carter, formed a band in their native southwestern Virginia in 1946. Between that date and 1966, when Carter died, the Stanley Brothers and the Clinch Mountain Boys became two of the most celebrated bluegrass groups in the world. After Carter's death, Stanley shifted the band's musical emphasis from bluegrass to an older, sadder, less adorned mountain style. As a bandleader he nourished such young and promising talents as Ricky Skaggs, Keith Whitley, Larry Sparks, and Charlie Sizemore. Stanley has recorded nearly 200 albums along with the Stanley Brothers, the Clinch Mountain Boys, as a solo artist, and to a broad new audience of more than 5 million on the soundtrack to O Brother, Where Art Thou?
more information

Accelerator Update

Sing Happy Birthday to CERN this Friday
Next month CERN will celebrate its 50th birthday. Fermilab and other particle physics labs are preparing a video birthday card that will be sent to CERN. Join us this Friday, September 24 at 11:30 a.m. on the front steps of Wilson Hall to sing Happy Birthday to CERN. For more information, contact Elizabeth Clements.

Hatha Yoga Classes at the High Rise
In today's highly competitive world, especially at work, stress becomes an imminent and overwhelming factor in a working life. Employees can find serenity during the work day without having to leave work. Learn to restore and repair the body with relaxation poses and proper breathing. Learn the benefits of yoga: destressing, lowering blood pressure, improve circulation and have clarity and piece of mind. Chris Baxter will be conducting Yoga classes at Fermilab in the Auditorium on Thursdays from noon to 1:00 p.m. beginning October 7. This 8-week class is $80.00. Registration can be made in the Recreation Office. Maximum of 25 people. Deadline to register is October 5. A yoga mat is required for this class.

Wilson Hall Warden Training
It's time for the annual WH Emergency Warden Training again! Training is available on September 27 at 1:30 p.m. and September 28 at 10:00 a.m. Class is not expected to last more than an hour.

Fermilab Film Series Friday
The Fermilab Film Series presents "O Brother, Where Art Thou?" on Friday, September 24 at 8:00 p.m. in Ramsey Auditorium. Tickets are $4.00.

During the shutdown, Fermilab Today will offer a series on the history and operation of the laboratory's accelerator complex. The transport lines is the third in the series.

The 750 keV transport line is the first of several transport or transfer lines that connect the five Fermi accelerators to each other in this order: Preaccelerator (Preacc) - 750 keV transport line - Linac - 400 MeV transport line - Booster - 8 GeV Injection line - Main Injector (MI) - A150 line for protons and the P150 line for antiprotons - Tevatron (TeV).

Read the Current Accelerator Update

View the Tevatron Luminosity Charts

In the News

FYI: AIP Bulletin of Science Policy News, September 22, 2004

Senate Funding Recommendations for Math and Science Partnerships

Senate appropriators have now passed FY 2005 appropriations bills funding the Math and Science Partnership (MSP) programs in both the Education Department and NSF. Under these bills, the Partnership program at the Department of Education would receive a 34.3 percent increase over FY 2004 funding, while the NSF Partnership program would be cut by 21.0 percent.

Read more

more information

Voter Registration in Wilson Hall

There will be an opportunity to register to vote in the November 2 elections in 1 North in Wilson Hall on Thursday, Sept 23 and Friday, Sept 24 between noon and 1:00 p.m. You must be a resident of Du Page or Kane County. Bring two pieces of identification, one showing your current residence (e.g. an addressed envelope). If you are a registrar for either Du Page or Kane County please contact Mike Albrow at x8618 because help is needed.

Upcoming Power Outages

September 24

Wilson Hall and all of Fermilab except for the Village and the Main Injector: Master Substation switch over will begin around 7:00 AM, no power site-wide for 1/2 hour.

September 25

Linac, Cross Gallery, Main Control Room, High Bay, MAC Room: feeder 40 work will begin at 7 AM; no power to these areas for eight hours