Fermilab Today

Thursday, March 11, 2010

Calendar

[Have a safe day!]

Thursday, March 11
2:30 p.m.
Theoretical Physics Seminar - Curia II
Speaker: Nausheen Shah, Fermilab
Title: Gauge-Higgs Unification Phenomenology in Warped Extra Dimensions
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over
THERE WILL BE NO ACCELERATOR PHYSICS AND TECHNOLOGY SEMINAR TODAY

Friday, March 12
11 a.m.
Special Joint Experimental-Theoretical Physics Seminar - One West
Speakers: Matthew Herndon, University of Wisconsin, Gregorio Bernardi, LPNHE, University of Paris
Title: Joint CDF/DZero Seminar: New Results (to be) Presented at Winter Conferences
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over
4 p.m.
Joint Experimental-Theoretical Physics Seminar - One West
Speaker: Clem Pryke, University of Chicago
Title: First Direct Search for Gravitation Modes in the CMB Polarization

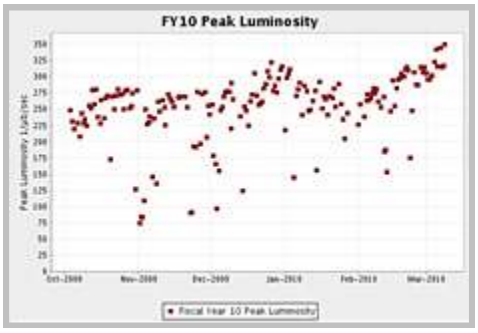
Click here for NALCAL, a weekly calendar with links to additional information.

Upcoming conferences

Campaigns

Feature

AD keeps records coming



The Accelerator Division achieved three new records last week and obtained some of the highest luminosity stores yet.

During approximately the last two weeks, initial luminosity has been steadily climbing from 300 μb-1/s to more than 350. With high initial luminosities and sustained integration time, the chances of discovery-generating collisions increases.

The average weekly integrated luminosity for the week ending Monday, March 8, rose to 61.84 inverse picobarns. This marks the third week in a row averaging over 60 inverse picobarns. In addition, two of this last week's stores ranked among the top five largest ever.

While AD Run Coordinators Mary Convery and Cons Gattuso were announcing these records during the March 10 All Experimenter's meeting, the Tevatron reached yet another new height, setting an average initial luminosity record of 354.4 μb-1/s up from the previous level of 353.2 .

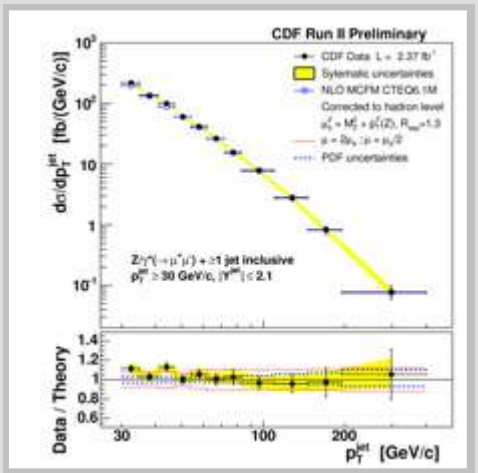
This week of record-setting work is far from an outlier. The Tevatron's overall integrated and peak luminosities are ahead of where they were at this time last fiscal year.

The Accelerator Division credits the success to a combination of hard work by all division lines, machine reliability that allows the stores to build upon one another, fine-tuning of equipment and, last week, studies using only an antiproton store. While the antiproton study requires more downtime, the run coordinators said it pays off in a luminosity boost and has become a regular part of accelerator operations.

You can view all of the recent luminosity plots here.

Result of the Week

CDF masters another Higgs background



The measured rate of jets produced in events that also contain a Z boson. The top plot shows the number of jets as a function of the momentum of the jets. The other plot demonstrates that the data agree well with theory, so that the ratio of data/theory is approximately one.

Often scientists at the Tevatron have to confront the challenge of disentangling small signals from large backgrounds. Sometimes complicated event topologies are involved, and those backgrounds are difficult to predict theoretically and therefore require experimental input. One example is the production of the Higgs boson (H) in association with another massive particle called the Z boson. The expected production rate of Z+H is much smaller than the one expected for events in which the Z boson is produced together with high-energy gluons and quarks. The quarks and gluons are fundamental pieces of the Standard Model of particle physics that reveal themselves in the detector as collimated flows of particles called jets. How well Tevatron scientists understand the Z+jets process impacts their ability to find the elusive Higgs boson.

So, before we can hope to see the Higgs boson, scientists must study the complicated quark and gluon interactions that create this Z+jets background. Physicists from the CDF collaboration have recently performed a detailed analysis of this jet production for events where the Z boson decays into a muon and an anti-

[Take Five]

[Tune IT Up]

H1N1 Flu

For information about H1N1, visit Fermilab's flu information site.

Weather

Thunder showers 56°/36°

[Extended Forecast Weather at Fermilab]

Current Security Status

Secon Level 3

Wilson Hall Cafe

Thursday, March 11
- Apple sticks
- Minnesota wild rice w/ chicken
- Tuna melt on nine-grain
- Italian meatloaf
- Chicken casserole
- Buffalo krispy chicken wrap
- Assorted sliced pizza
- Mandarin chicken

[Wilson Hall Cafe Menu]

Chez Leon

Thursday, March 11 Dinner
- Closed

Wednesday, March 17 Lunch
- Orange-herb game hens
- Buttered green beans
- New potatoes
- Key lime pie

[Chez Leon Menu]
Call x3524 to make your reservation.

Archives

[*Fermilab Today*]

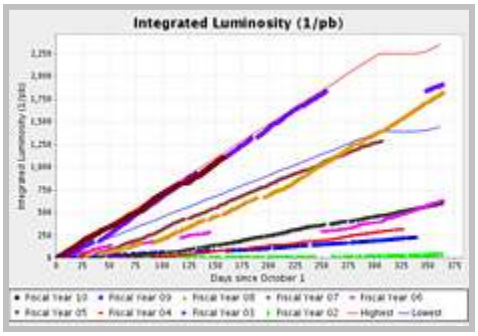
[Result of the Week]

[Safety Tip of the Week]

[CMS Result of the Month]

[User University Profiles]

[ILC NewsLine]



-- Tona Kunz

Feature

Service Desk announcements in 140 characters

FNALServiceDesk

If the laboratory's e-mail and Internet servers go down, Service Desk representatives can find themselves informing Fermilab employees and users about the problem one-by-one over the phone.

Now the Service Desk has an additional method of communicating with the laboratory at large: Twitter. Twitter is a social networking site that allows users to post short messages, called tweets, which compile on a Web page listing the most recent messages first. You can see a user's tweets whether or not you have a Twitter account.

Service Desk representatives will use the Twitter account to make announcements, to provide information about outages, to send warnings about phishing e-mails and to highlight relevant articles.

[Click here] to see tweets by FNALServiceDesk.

[Click here] to sign up for a Twitter account. Read this [FAQ page] to find answers to frequently asked questions about Twitter.

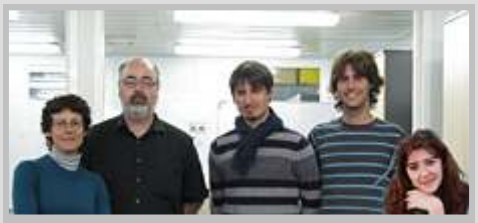
-- Eileen Berman, Service Desk group leader

Photo of the Day

New employees – March 1

muon. When the scientists compared the measured distributions of jet energy and jet multiplicity to the predictions from quantum chromodynamics (QCD), they found that these QCD inspired models describe the data quite well. The new results are also consistent with a similar measurement performed on events where the [Z boson decays into an electron and positron].

Now that scientists have verified that the QCD predictions are working well by making this important measurement, they can return to their quest for the Higgs boson with confidence that they are one step closer.



From the left: Veronica Sorin, Mario Martinez, Lorenzo Ortolan, Stefano Camarda (all with Barcelona), and Monica D'Onofrio (Liverpool).

[Click here] for more information.

-- edited by Craig Group

Accelerator Update

March 8-10
- Four stores provided ~37.75 hours of luminosity
- CDF fixed detector problem
- Store 7661 set record with a luminosity of 354.4E30
- FESS configured MI LCW pumps for summer mode
- MIRF2 repaired
- Meson MTest T995 resumes taking beam
- Four-hour access on 3/11/10 to bring CUB chiller online

[Read the Current Accelerator Update]
[Read the Early Bird Report]
[View the Tevatron Luminosity Charts]

Announcements

Latest Announcements

[English country dancing - Sunday, March 28]

[Robert Oppenheimer play at Waubonsee in Sugar Grove - March 20]

[Employee Discount at Batavia Rosati's]

[Watch your mail station for the arrival of your Fermilab Statement of Benefits]

[Employee Discount at Batavia Rosati's]

[Harlem Globetrotters Special Ticket]

Info

Fermilab Today is online at: www.fnal.gov/today/

Send comments and suggestions to: today@fnal.gov

Visit the Fermilab home page

Unsubscribe from *Fermilab Today*

Gabriel Dunn, PPD; Bridgett Thomson, FESS; Sergey Kazakov, TD.

In the News

Einstein passes cosmic test

From *Nature News*, posted Mar. 10, 2010

It's another victory for Einstein — albeit not a resounding one. General relativity has been confirmed at the largest scale yet. But the galactic tests used to put the theory through its paces cannot rule out all rival theories of gravity.

General relativity has been rigorously tested within the Solar System, where it explains the motion of planets with precision. But its reach between galaxies has been harder to verify and should not be taken for granted, says cosmologist Alexie Leauthaud, at the Lawrence Berkeley National Laboratory in California. "It's actually a tremendous extrapolation to assume that general relativity works on cosmic scales," she says.

If general relativity does break down at large scales, it could help cosmologists to explain away one of their biggest headaches: dark energy. In the 1990s, astronomers were surprised to discover that the expansion of the Universe is accelerating. That runs counter to the predictions of general relativity, which suggests that gravity's grip should be slowing the expansion. To explain this, cosmologists now invoke a 'dark energy', a force that makes up almost three-quarters of the matter and energy in the Universe and pushes it apart. But the origin of dark energy remains a mystery.

Read more

Submit an announcement