SCIENCE FOR THE BENEFIT OF HUMANITY

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Kenichi Hatakeyama

Date of birth: November 28, 1973

Place of birth: Takanosu, Akita, Japan

Citizenship: Japan

Employment and Education:

- August 2003 – present:
  Research Associate, The Rockefeller University
  CDF experiment at Fermi National Accelerator Laboratory.
- July 1998 – June 2003:
  Ph.D. in Physics, The Rockefeller University
  CDF experiment, thesis on "Measurement of the Diffractive Structure Function of the Antiproton in Proton-Antiproton Collisions at $\sqrt{s} = 1800$ and 630 GeV".
  Advisor: Professor Konstantin Goulianos.
- April 1996 – March 1998:
  M.Sc. in Physics, Waseda University
  CDF experiment, thesis on "Study of Diffractive Dijet Production in $\bar{p}p$ Collisions at $\sqrt{s} = 630$ GeV".
  Advisor: Professor Shunichi Hasegawa.

Leadership Experience:

- CDF QCD physics group convener: January 2007 – present
- CDF Jet Energy and Resolution group convener: April 2005 – November 2006
- CDF offline production coordinator: August 2004 – January 2005

Research Experience:

Research Associate, The Rockefeller University / CDF Collaboration:

- Measurement of the inclusive jet cross section
  - The measurement yielded valuable inputs for the parton distribution inside the proton.
- Search for new heavy particles decaying into dijets
  - The data were found to be in good agreement with the standard model predictions. No convincing signal of new heavy particles was observed.
  - Established limits on the production of the new particles decaying into dijets. The limits on the excited quarks in the quark compositeness model, new massive gluons, color-octet techni-ρ's in the technicolor model, E_6 diquarks are the most stringent limits to date.
- Determination of jet energy scale and improving jet energy resolution
  - Contributed to improving the jet energy scale determination by tuning the calorimeter simulation and determining the jet energy correction which played a key role in the most precise top quark mass measurement and also benefited many other analyses.
  - Made a measurement of the b-quark jet energy scale using the $Z \rightarrow b\bar{b}$ signal.
  - Developed an algorithm which utilizes the tracking and shower-max detector information in addition to the calorimeter information to improve the jet energy resolution, aiming to increase sensitivity of searches for the Higgs boson and other dijet mass resonances.

Ph.D. in Physics, The Rockefeller University / CDF Collaboration:

- Measurement of the diffractive structure function in diffractive dijet production in $p\bar{p}$ collisions at $\sqrt{s} = 1800$ and 630 GeV
  - Observed a breakdown of QCD factorization in hard diffraction, *i.e.*, the diffractive structure function depends on the type of colliding particles and the center-of-mass energy of the interaction.
- First measurement of inclusive double pomeron exchange in $p\bar{p}$ collisions at $\sqrt{s} = 1800$GeV
  - Confirmed a conjecture based on previous studies that, in double pomeron exchange events, either two rapidity gaps in the event would survive or simultaneously be filled by other partonic interactions.
- Setup and installation of the CDF MiniPlug calorimeters
  - Test of multianode photomultiplier tubes used for the MiniPlug readout using LEDs.
  - Test of the assembled MiniPlug calorimeter using cosmic ray muons.
  - Installation of the MiniPlug calorimeter in the collision hall.

Presentations:

1. "Recent QCD Results from CDF", Kobe University High Energy Physics Seminar, November, 2007.
2. "Recent QCD Results from CDF", University of Tsukuba High Energy Physics Seminar, November, 2007.
3. "Jet Physics at CDF", Michigan State University High Energy Physics Seminar, Michigan State University, October, 2007.
4. "Jet Physics at CDF", ISMD 2007 - XXXVII International Symposium on Multiparticle Dynamics, LBNL, August, 2007
5. "Jets at CDF", CMS Jet Workshop, December 2006.
6. "Heavy Flavor Production at the Tevatron", ICHEP 2006: International Conference on High Energy Physics, Moscow, Russia, July - August 2006.
7. "How to calibrate jet energy scale?" TOP 2006: International Workshop on Top Quark Physics, Coimbra, Portugal, January 2006.
8. "Physics with High Energy Jets at the CDF Experiment", University of Wisconsin High Energy Physics Seminar, Madison WI, USA, October 2005.
9. "Diffraction and jets at CDF", International Workshop: Low-x Physics, Prague, Czech Republic, September 2004.
10. "Soft Double Pomeron Exchange in CDF Run 1", Small-x and Diffraction 2003, Batavia, Illinois, September 2003.
11. "Rapidity gaps in $\bar{p}p$, ep and e^+e^- collisions", ICHEP 2002: International Conference on High Energy Physics, Amsterdam, Netherlands, July 2002.
12. "Multigap Diffraction Results from CDF", DPF 2002 : Meeting of the Division of Particles and Fields of the American Physics Society, Williamsburg, Virginia, May 2002.
13. "CDF Run1 Diffractive Results", LISHEP 2002, Workshop on Diffractive Physics, Rio de Janeiro, Brazil, February 2002.
14. "Diffractive Results from CDF Run 1", Diffractive Monte Carlo Workshop, Batavia, Illinois, July 2001.
15. "Study of Diffractive Dijet Production", High Energy QCD Workshop : Beyond The Pomeron, Upton, New York, May 2001.
16. "Diffractive Results from the Tevatron", 7th Conference on the Intersections of Particle and Nuclear Physics, Quebec, Canada, May 2000.
17. "Diffraction Results from the Tevatron", The XXXVth Rencontres de Moriond - QCD and Hadronic interactions, Les Arcs, Savoie, France, March 2000.
18. "Single Diffractive Dijets at CDF", New Perspectives '99, Batavia, Illinois, July 1999.
19. "Single Diffractive Dijets at CDF", QCD and Weak Boson Physics workshop in preparation for Run II at the Fermilab Tevatron, Batavia, Illinois, June 1999.
20. "Diffractive Dijet Production at the Tevatron and the Diffractive Structure Function of the Proton", American Physics Society Centennial Meeting, Atlanta, Georgia, March 1999.

Selected List of Publications and Preprints:

1. J. Donini *et al.*, "Energy Calibration of b-Quark Jets with $Z \to b\bar{b}$ Decays at the Tevatron Collider," Submitted to Nucl. Instrum. Methods Phys. Res. A, hep-ex/0801.3906.
2. S. D. Ellis, J. Huston, K. Hatakeyama, P. Loch, M. Tonnesmann, "Jets in Hadron-Hadron Collisions," Prog. Part. Nucl. Phys. **60**, 484 (2008).
3. K. Hatakeyama (for the CDF Collaboration), "Jet Physics at CDF," *To be published in the proceedings of XXXVII International Symposium on Multiparticle Dynamics, LBNL, August, 2007*, hep-ex/0712.2038.
4. K. Hatakeyama, CDF and DØ Collaborations, "Heavy flavor production at the Tevatron," *Published in the proceedings of 33rd International Conference on High Energy Physics (ICHEP 2006), Moscow, Russia, July 26 - August 2, 2006.*
5. A. Abulencia *et al.*, CDF Collaboration, "Measurement of the Inclusive Jet Cross Section in $p\bar{p}$ Interactions at $\sqrt{s} = 1.96$ TeV Using a Cone-based Jet Algorithm," Phys. Rev. D **74**, 071103(R) (2006).
6. K. Hatakeyama (for the CDF and DØ Collaborations), "How to calibrate the jet energy scale?" Proceedings of Science (TOP2006) 014 (2006).
7. A. Bhatti *et al.*, "Determination of the Jet Energy Scale at the Collider Detector at Fermilab," Nucl. Instrum. Methods Phys. Res. A **566**, 375 (2006).
8. D. Acosta *et al.*, CDF Collaboration, "Inclusive Double Pomeron Exchange at the Fermilab Tevatron $\bar{p}p$ Collider," hep-ex/0311023, Phys. Rev. Lett. **93**, 141601 (2004).
9. K. Goulianos *et al.*, "The CDF MiniPlug calorimeters," Nucl. Instrum. Methods Phys. Res. A **496**, 333 (2003).
10. K. Hatakeyama, CDF, L3, ZEUS and H1 Collaborations, "Rapidity gaps in $\bar{p}p$, ep and e^+e^- collisions," FERMILAB-CONF-02-263-E, *Published in the proceedings of 31st International Conference on High Energy Physics (ICHEP 2002), Amsterdam, The Netherlands, 24-31 July 2002.*
11. D. Acosta *et al.*, CDF Collaboration, "Diffractive Dijet Production at $\sqrt{s} = 630$ and 1800 GeV at the Fermilab Tevatron," Phys. Rev. Lett. **88**, 151802 (2002).
12. K. Hatakeyama, CDF Collaboration, "CDF Run 1 Diffractive Results," FERMILAB-CONF-02-086-E, *Prepared for LAFEX International School on High-Energy Physics (LISHEP 2002). Session C: Workshop on Diffractive Physics, Rio de Janeiro, Brazil, 4-8 February 2002.*
13. K. Hatakeyama, CDF and DØ Collaborations, "Diffractive Physics at the Tevatron," AIP Conf. Proc. **549**, 542 (2002).
14. T. Affolder *et al.*, CDF Collaboration, "Diffractive Dijets with a Leading Antiproton in $\bar{p}p$ Collisions at $\sqrt{s} = 1800$ GeV," Phys. Rev. Lett. **84**, 5043 (2000).
15. K. Hatakeyama, CDF and DØ Collaborations, "DIFFRACTIVE RESULTS FROM THE TEVATRON," FERMILAB-CONF-00-116-E, *Published in the proceedings of 35th Rencontres de Moriond: QCD and High Energy Hadronic Interactions, Les Arcs, Savoie, France, 18-25 March 2000.*