CURRICULUM VITAE

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Personal Information

- Address: via Gregorio XIII, 6 - I-00040 Monte Porzio Catone (Rome), Italy
  Date and place of birth: April 10, 1970 - Rome
  Citizenship: Italian
  Marital status: married

Education

- Universitá dell'Aquila (L'Aquila, Italy) - Department of Physics, Doctorate in Physics, February 16, 2001. The argument of the thesis is: "Study of leptonic decays of hadrons with heavy flavor quarks produced in $p\bar{p}$ interactions at $\sqrt{s} =$ 1.8 TeV".

- Universitá di Roma "Tor Vergata" (Rome, Italy), *Laurea* in Physics, Nuclear and Subnuclear Physics, December 19, 1996. The argument of the thesis is: "Study of W boson production in association with jets containing heavy flavor quarks and measurement of $t\bar{t}$ pairs production cross section".

- Liceo Scientifico Statale di Grottaferrata "Bruno Touschek".
  Maturità scientifica, July 1989.

Professional Experience

• Staff Research Scientist, Laboratori Nazionali di Frascati of INFN (Italy), October 2004 - to date.

→ CDF II Experiment - Study of the sub-sample of dimuon events that appears to be responsible for the observed discrepancies of the b quark pairs cross section measurements, $\sigma_{b\bar{b}}$, with respect to the prediction;

→ CDF II Experiment - b-quark pairs production cross section measurement, $\sigma_{b\bar{b}}$, looking at events with muon pairs with large impact parameter originating from semileptonic b-quark decays;

→ CDF II Experiment - Study of B into J/Ψ decays, inclusive b-quark production cross section measurement via $B^+ \to J/\Psi K^+$ channel;

→ CDF II Experiment - Responsible for the energy scale calibration and maintenance of the CDF central hadron calorimeters;

→ CDF II internal referee for Z' and high mass dielectron searches.

→ KLONE collaboration (LNF) - Partecipation to the R&D project for the measurement of the neutron detection efficiency of a KLOE electromagnetic calorimeter prototype (Lead-scintillating fibers). Three test-beams are carried on at the Svedberg Laboratory neutron beam facility at Uppsala varying neutron beam energy and intensity.

→ KLOE-2 collaboration (LNF) - Realization and characterization of a new forward calorimeter prototype surrounding the inner quadrupoles, QCALT, devoted to the identification of photons from rare K_L decays.

→ KLOE-2 collaboration (LNF) - Responsible for the design, prototyping and realization of a small angle crystal calorimeter to improve the acceptance for tagging low energy photons coming from rare Eta and Kaon event decays ($K_s \to \gamma\gamma$, $\eta \to \pi_0\gamma\gamma$).

→ Mu2e collaboration (Fermilab) - Characterization, simulations, design and realizations and tests of small size prototypes for the crystals calorimeter readout by new generation solid state photosensors for the Mu2E experiment. L3 manager for the mechanics design and integration of the calorimeter.

• Post doctoral Researcher (*Assegno di Ricerca*), Laboratori Nazionali di Frascati of INFN (Italy), February 2002 to September 2004. The research activity is carried on at the Collider Detector at Fermilab experiment (CDF II).

→ Development of solutions to compensate for the reduced charge integration time of the CDF central calorimeter photomultipliers with 400 ns bunch spacing of the upgraded Tevatron;

→ Development of a real-time object oriented software package for CDF to analyze laser data;

→ Responsible for the installation, debug and performance monitoring of the new discriminators of the electromagnetic and hadronic calorimeters and for the calibration of the timing system;

• Physics Research Doctorate, L'Aquila University (Italy), November 1997 - March 2001. The resarch activity is carried on at the Collider Detector at Fermilab experiment (CDF).

→ Study of the heavy flavor content of events containing a low-p_T lepton plus jets; CDF Run I data show an excess of events with kinematic properties that are consistent with the production of a light scalar quark;

→ Search for narrow bound resonances in the dimuon sample with mass between the J/Ψ and the Υ;

→ Partecipation to the Stanford Linar Accelerator Laboratory Summer School: Secrets of B Mesons, August 2002.

• Fermilab - Guest Scientist at CDF.
February to September 1997 - April to December 2001.

• Tor Vergata University (Rome) and Laboratori Nazionali di Frascati of INFN, experimental *Laurea* thesis carried on at the Collider Detector at Fermilab experiment (CDF), June 1995 - December 1996.

→ Revision of the b-quark tagging efficiency measurement leading to the new and final Run I top pairs production cross section in the $W \to e\ (\mu), \nu_e\ (\nu_\mu)$+jets (lepton plus jets) channel. Development of the energy corrections for b flavoured jets to improve the top events acceptance and mass resolution.

• Pre graduate Fellow at Fermi National Accelerator Laboratory (Fermilab), July 1995 to October 1995. He works in the CDF experiment and gains the first particle physics experience during the Thesis activity.

Outreach

→ Responsible for educational experiments " Revealing particles with calorimeters" at the LNF "Incontri di Fisica: refresher/educational course for high school teachers" since year 2001.

→ Responsible for tutoring undergraduate students at the LNF Summer Stages.

Conferences

• A Crystal Calorimeter for the Mu2e Experiment; CHEF 2013 - Calorimetry for High Energy Frontier, Paris (France) - 2013, April 22 - 25.

• CCALT: crystal calorimeter at KLOE-2; 14th International Conference on Calorimetry in High Energy Physics, Beijing (China) - 2010, May 10 - 14.

• Study of Multimuons Events at CDF; Les Rencontres de Physique de la Valle d'Aoste 2009, La Thuile, Aosta Valley (Italy) - 2009, March 1-7.

• Study of Multimuons Events at CDF; XVII International Workshop on Deep-Inelastic Scattering and Related Subjects DIS 2009, Madrid (Spain) - 2009, April 26-30.

• Study of Multimuons Events at CDF; The 2009 Europhysics Conference on High Energy Physics, Krakow (Poland) - 2009, July 16-22.

• Measurement and simulation of the neutron response and detection efficiency of a Pb-scintillating fiber calorimeter; SCINT 2007, IEEE-9th International conference on Inorganig Scintillators and their Applications, Winston-Salem, NC USA - 2007, June 4-8.

• Status of the observed and predicted $b\bar{b}$ production at the Tevatron; XIV International Workshop on Deep Inelastic Scattering, Tsukuba (Japan) - 2006, April 20-24.

• High Energy Physics and its Experiments; WYP-2005, World Year of Physics dissemination program, Seminar at Liceo Serpieri - Rimini (Italy) 2005, April 15.

• Ecfa Study, First workshop on Physics and Detectors for a Linear Collider, Montpellier (France) - 2003, November 13-16.

• Properties of heavy flavour jets produced at Tevatron $\sqrt{s} = 1.8$ Tev, Incontri di Fisica delle Alte Energie, XV (IFAE), Lecce (Italy) - 2003, April 23-26.

• Higgs searches at Tevatron, Tor Vergata University, Rome (Italy) - November 2000.

• The latest Run I result of the top cross section measurement, New Perspectives '99, Fermilab - June 1999.

Research Activity details

• Current position

Mu2e The Mu2e experiment looks for the CLFV decay $\mu \to e$. It requires a high energy and time resolution calorimeter to complement the tracking detector in the measurement of track energy to separate conversion electrons from $\mu \to e$, with 105 MeV/c momentum, from the electrons coming from the decay in orbit of orbiting muons in the Al target,$\mu \to e\ \nu$, that have a momentum spectrum with 105 MeV/c endpoint. It also needs to reject background due to reconstruction errors or cosmic ray muons. The requirements for the calorimeter are 5% energy resolution, <1 ns time resolution and $\sim$ cm spatial resolution. In the 100 MeV energy region a total absorption calorimeter employing a continuous and homogenous medium is needed. The Mu2e collaboration has chosen to consider a crystal calorimeter made of two possible type of scintillating crystals, LYSO or BAF_2. Given the experience acquired in crystal calorimetry for the KLOE-2 collaboration the Frascati group has been asked to take the responsibility of designing and realizing the calorimeter detector.

I personally followed all the stages of the Mu2e approval by the funding agencies

in USA and in Italy. We showed all the phases of the R&D we have been carring on to study the performancies and to tune them with the requirements highlighted by simulation studies.

We built different crystals array prototypes ameliorating everytime the FEE electronics and the photosensors control. All these prototypes have been tested with electrons or photons beams at BTF (Frascati) and Mami (Mainz).

The calorimeter design is currently described in all its details in the Mu2e Technical Design Report prepared for the CD-2 approval expected by fall 2014.

As L3 manager I'm currently responsible of the mechanics design an integration of the calorimeter. It consists of two identical donuts 1500 mm outer diameter, 700 mm inner diameter, composed each of an inner cylinder made of light composite material, an outer stainless steel structural ring, one light frontal plate, a lumber of 1860 self-standing crystals equipped with two APD photosensors and FEE electronics.

<u>CDF</u> The measurement of $\sigma_{b\bar{b}}$ described in **Physycal Review D 77 (2008) 072004** agrees with NLO predictions. A detailed investigation of the dimuon data sample indicates that the discrepancies with respect to previous measurement are related to the requirement that the two muons tracks are reconstructed with the silicon detector with hits in the two inner layer and at least two in the four outher layers; in other words, that at least one of the two muons has to decay inside the 1.5 cm radius beam pipe. When this silicon requirement is released the measurement agrees with previous measurements and does not match the theory.

This is due to a set of events with interesting properties that were unaccounted for when using looser silicon cuts. A large fraction of these events is attributed to muons arising from in flight decays and punch-throughs of hadronic prongs of K_s^0. The remaining fraction consists of events where the muons show a very long impact parameter tail and have a very high muon multiplicity in a narrow cone around the primary muons. These events cannot be explained in terms of SM events or detector failures. The analysis has been scrutinized by the CDF collaboration and **CDF9230** is an article draft that will be soon submitted to PRD.

<u>CDF</u> At the Tevatron the measurement of the bottom quark cross section, σ_b, and the measurement of the cross section for producing both b and $\bar{b}$ quarks centrally and above a given momentum thresholds, $\sigma_{b\bar{b}}$, is an important test of the power of QCD to predict absolute rates in hadronic collisions. In QCD calculations, the long- and short- distance dynamics of the hadronic hard-scattering cross section are factorized into nonperturbative parton distribution functions (PDF) and fragmentation functions, and perturbatively calculable hard-scattering functions.

In **Physycal Review D 73 (2006) 014026** all the Tevatron measurements

have been compared to the same QCD prediction and they appear to be inconsistent among themselves and higher than the expectation.

Measurements of inclusive b cross sections, σ_b, and b pairs cross sections, $\sigma_{b\bar{b}}$, are sensitive to different contributions of the perturbative level of the QCD hard scattering calculations; inclusive b productions is contributed by Next to Leading Order terms (NLO) $b\bar{b}$ pairs production is dominated by leading order terms (LO). Precise measurements can contribute to assess the role of different terms in the pertubative prediction and improve the modeling of fragmentation functions.

The analysis described in **Physycal Review D 75 (2007) 012010** measures the σ_b cross section using the decay $B^{\pm} \rightarrow J/\Psi K^{\pm}$ with $J/\Psi \rightarrow \mu^+\mu^-$ reconstructing the invariant mass peak of the decay particles in different p_T bins.

Acceptancies are measured from Monte Carlo using a NLO calculation in conjunction with EVTGEN for B hadrons decays and the GEANT based simulation of the CDF detector. To rely on Monte Carlo the the most relevant efficiencies and acceptancies are cross-checked using data control sample.

A second analysis determines the production rate of muons originating from b- and $\bar{b}$-quarks semileptonic decays. A fit to the impact parameter distributions of muons allows to distinguish from muons coming from b- c-quark decays or prompt decays of quarkonia and Drell-Yan production. The fit uses heavy flavor impact parameter templates determined using the HERWIG Monte Carlo generator. Since the analysis is based on lifetime distributions, HERWIG has to reproduce the measured abundances of heavy flavor hadrons.

To have the right b- and c- hadrons composition, produced by the heavy quarks fragmentation, HERWIG has been tuned to reproduce the PDG fragmentation fractions for b-quark and the experimental results from BELLE, CLEO, HERA, LEP for c-quark. This work is documented in **Physycal Review D 77 (2008) 072004**.

Both results agree with the Standard Model prediction.

<u>CDF</u> Responsible for the absolute energy scale calibration of the Central (CHA) and EndWall (WHA) hadron calorimeters and for the maintainance of the calorimeters hardware during the data-taking operations. The energy scale is set using a mixture of techniques: the photomultipliers gain stability is monitored by means of frequent nitrogen Laser runs. The laser light shines the light guides facing the photomultiplier photocatodes thus originating a reference pulse height monitored weekly. The scintillator output degradation is checked looking at real energy deposition in the calorimeter towers using minimum ionizing particles (muons from J/Ψ decays reconstructed using tracking information). For this pourpose a C++ based package is developed to run automatically every 50 pb^{-1} of integrated luminosity on the dimuon trigger data set. The hadronic energy response to muon of each calorimetric tower is compared to the RUN I response

(when the calorimeter was calibrated using ^{137}Cs source system). The absolute energy scale is determined at the level of 1-2% precision.

A ^{137}Cs sources system determines the absolute energy scale for the WHA calorimeter; this procedure relies on the test beam of '83 - '85 that used π's with energy greater than 10 GeV.
The absolute energy scale calibrations and its stability contribute to the improvement of the jet energy scale described in **Nucl. Instrum. Meth. A 566 (2006) 375**. This is very important in reducing the sistematic uncertainty in precise elettroweak measurements like the top quark mass.

<u>KLONE</u> The detection of neutrons is usually performed with organic scintillators where the neutrons undergo elastic scattering with proton of hydrogen atoms. Nevertheless rem counters also take advantage of medium-high Z materials to increase the detection response through inelastic processes that produce secondary neutrons. The KLONE collaboration performed three test beams, at the neutron facility of Uppslala Svedberg Laboratory, using the KLOE electromagnetic prototype. This calorimeter is composed of 200 layers of 1 mm blue scintillating fibers glued in grooved lead layers. The trigger/DAQ system is performed with NIM/VME technology. The test beam measurements show indeed an enhancement of the neutron efficiency and are in fair agreement with the FLUKA simulation.

The detector is calibrated using cosmic ray runs. The contribution of a beam halo to the detection efficiency is determined studing the time of flight distributions. A NE-110 scintillator detector is built for reference measurements, read-out with standard photomultipliers. Design and construction of segmented WLS fibers - scintillator strips detector for determination of fthe gemetrical beam profile, read-out with multi-anode photomultipliers. This measurement is presented at the **IX IEEE Scint07 Conference**. The measured efficiency ranges between 30 to 50%, depending on energy, at the lowest trigger threshold; four times larger than expected for an equivalent scintillator thickness.

<u>KLOE-2</u> The KLOE-2 proposal includes the addition of a new forward calorimeter, QCALT, to increase the photons detection acceptance in rare events decays ($K_L \rightarrow 2\pi^0$). QCALT is a high granularity calorimeter based on tungsten scintillator tiles + WLS fibers read out with silicon photodevices (SIPM). The calorimeter consists of around 2000 5x5x.5 cm^3 tiles, assembled in two barrel calorimeters 12 wedges each, for 1 m lenght and 5 cm thickness.

The R&D phase consisted on

- characterization of the SIPM response with a pulsed LED;
- study of the optical connection of the SIPM to scintillating fibers and of the response to a β source;

– construction of the first prototype cell, instrumented with Hamamatsu MPPC of 400 pixels and testing with cosmic rays and the electron beam at the Beam Test Facility of LNF.

Development of a DAQ/trigger system to read out the SIPM signals.

KLOE-2 In the new design of the Dafne interaction region the position of the quadrupoles increases the acceptance of the central calorimeter from 21 to 18 degrees. In this volume is possible to insert few crystals to improve the acceptance for tagging low energy photons coming from rare Eta and Kaon event decays ($K_s \to \gamma\gamma, \eta \to \pi_0\gamma\gamma$).

The proposed solution is to insert an homogeneous calorimeter immersed in a 0.52 kgauss axial magnetic field, CCALT, based on the new generation of crystals, LYSO, characterized by a very high light yield (60% of NaI), 40 ns emission time, high density and radiation lenght. These crystals match the request for a high efficiency for low energy photons and an excellent time resolution needed by the calorimeter to sustain the high level of machine background events.

CCALT needs to maximize the light collection to improve its timing performance so that we selected as photosensor the fastest APD on the market from Hamamatsu.

We built a prototype matrix of 2x2x15 cm^3 LYSO crystals read-out by 0.5x0.5 Hamamatsu avalanche photodiodes (APD) and we tested it using cosmic rays an at the electrons beam test facility of Frascati.

The measurements show a very good time resolution of around 200 ps and a light yield of 2000 photoelectrons per MeV.

We studied the energy resolution of this kind of calorimeters, that is limited by the containment of the shower and by the electronic noise. For this purpose we built aset of much larger prototypes, the first consisting of 21 crystals, 9 LYSO for an inner matrix and 12 PBWO for outer leakage recovery (3 Moliere radius in total), we measured 5% energy resolution @100 MeV.

- Post Doctoral Research

The LNF group is historically responsible for the building, upgrading, maintenance and calibration of the central hadronic calorimeter of the CDF experiment leading the commissioning of the central hadron calorimeters for Run II.

The hadron calorimeters underwent minor upgrades going from Run I to Run II; the front end electronics has been replaced to substain the higher luminosity acquisition rate; all the photomultipliers functionality has been restored. The shorter acquisition gate causes a loss of the charge integration of photomultipliers pulses and various techniques are developed to set back and monitor the absolute energy scale of the calorimeters using also the first collision data from the Tevatron.

An object oriented software package is developed to analyze (online) laser runs for the calibration of the electronic chain from the photomultipliers to the front-end electronics.

Involved in the installation, calibration, performance monitoring and commissioning of the new timing system for the hadronic and electromagnetic calorimeters (**Nucl. Instrum. Meth. A 565 (2006) 538**).

The timing calibrations of the detectors, the debugging of the new discriminators installation and their thresholds settings have been checked through many "engineering" runs of $p\bar{p}$ collisions that have been analyzed using software packages developed in C++ language within the AC++ framework of the CDF offline software.

- Physics Research Doctorate

Detailed study of the data set containing a low-p_T lepton plus jets with heavy flavor searching for a light scalar quark (mass in the range of $\sim$3.5 GeV/c^2) with a long lifetime and an anomalous semileptonic branching ratio. At the Tevatron energies, heavy flavor jets coming from b and c quarks adronization show a displaced vertex with rispect to the primary vertex of the event due to the effect of the long lifetime of heavy flavor hadrons ($\tau \simeq 1$ ps) together with the Lorentz boost acquired by jets. These heavy flavor jets are identified using tagging algorithms (SECVTX, Jetprobability) based on the location of the secondary vertex. The semileptonic decay rate of heavy flavor quarks is instead measured looking for soft (low momentum) leptons not isolated in the calorimeter, contained in jets with secondary vertices. These leptons are found by the Soft Lepton Tagging algorithm (SLT).

The basic results of this analysis is the observation of an excess of events containing an additional soft-lepton inside one of the jets recoiling against the jet containing the trigger lepton significantly larger that what is expected for the production and semileptonic decay of b and c hadrons. This part of the analysis has been published in **Physical Review D. D69:072004,2004**.

Also an excess of events with an additional lepton inside the jet containing the trigger lepton was observed. These events and their kinematical properties are descibed in the paper published in **Physical Review D72:072002,2005**.

As a working ipothesis, the excess can be interpreted (in terms of supersimmetric signal) as the pair production and decay of a spin 0 scalar quark. The best candidate is the supersimmetric partner of the b quark: $\tilde{b} \to c\tilde{\chi}^{\pm}$ and $\tilde{\chi}^{\pm} \to l\tilde{\nu}_l$, with $m_{\tilde{b}} =$ 3.65 GeV/c^2, $m_{\tilde{\nu}} = 0$ and $\tau_{\tilde{b}} \simeq 1$ ps. This process has been implemented in the Herwig Monte Carlo generator using a matrix element calculation by K. Hikasa and M. Kobayashi for SUSY models and reproduces most of the features of the observed anomalies. These results are explained in term of SUSY signal in **Physical Review D73:014025,2006**.

Based on the interpretation of a scalar quark, this analysis was extended to a search of narrow bound states of two scalar quarks by studying the dimuon invariant mass spectrum between 6 and 9 GeV/c^2. This latter study is published in **Physical Review D72:092003,2005**.

- *Laurea* Thesis

The argument of the thesis is the study of the $W+$ jet sample where $t\bar{t}$ production

events can be isolated and top production cross section measured. Each top quark in the event decays to a W boson and a b quark with a Branching Ratio of $\sim 100\%$ and there are different research channels according to the decay of the two W bosons present in the event (to hadrons or to leptons). It is used the "lepton plus jets" channel, where one of the two W decays to leptons, $W \to l\nu_l$ ($l = e,\ \mu$) and the other to two adronic jets. The event topology consists of a lepton with high momentum isolated in the calorimeter, an unbalance of transverse energy in the calorimeters ($\not\!\!E_T$) indicating the presence of an undetected neutrino and at least four jets; furthermore it is required that at least one of the jets contains a secondary vertex, reconstructed by the SECVTX algorithm, in order to enhance the presence of b quarks.

The measurement of the top production cross section at Tevatron provides the opportunity to test the Standard Model predictions comparing the data with the QCD + $t\bar{t}$ prediction of $W+$ jets events as a function of the multiplicity and transverse momentum of the jets in the event.

The highest contribution to background events for top comes from the direct QCD production of W boson associated to jets from gluons radiation that split to heavy flavor pairs. The amount of these events is estimated from Monte Carlo.

The excess over the background of events with at least three jets is attributed to top; geometrical acceptancies of the analysis cuts and tagging efficiencies are measured in a top Monte Carlo sample. With an integrated luminosity of $\int \mathcal{L}\mathrm{dt} = 105 \pm 4\ \mathrm{pb}^{-1}$ we count 29 $W+ \geq 3$ jets events with 7.99 ± 0.98 background events, corresponding to a $\sigma_{t\bar{t}} = 5.1 \pm 1.5$ pb. This value is the official result of the CDF Run I and is published on **Physical Review D64:032002,2001** .

List of Papers

Primary Publications

- "Measurement of correlated b-bbar production in p-pbar collisions at s**(1/2) = 1960 GeV," Phys. Rev. D **77** (2008) 072004.
- "Measurement of the B^+ production cross section in $p\bar{p}$ collisions at $\sqrt{s} = 1960$ GeV", Phys. Rev. D **75** 2007012010.
- F. Happacher, "Measurement and simulation of the neutron response and detection efficiency of a Pb-scintillating fiber calorimeter", in proceedings of IX IEEE Scint07 Conference - Winston Salem, North Carolina USA, june 4-8, 2007.
- F. Happacher, "Status of the observed and predicted $b\bar{b}$ production at the Tevatron", in proceedings of XIV International Workshop on Deep Inelastic Scattering - Tsukuba (Japan), april 20-24, 2006.
- F. Happacher, "Properties of jets with heavy flavor produced in in p anti-p interactions at $\sqrt{s} = 1.8$-TeV", in proceedings of IFAE 2003 - Lecce, april 23-26, 2003.

- F. Happacher, P. Giromini and F. Ptohos, "Status of the observed and predicted b barb production at the Tevatron," Phys. Rev. D **73** (2006) 014026.
- G. Apollinari *et al.*, "Search for narrow resonances below the Upsilon mesons," Phys. Rev. D **72** (2005) 092003.
- G. Apollinari *et al.*, "Phenomenological study of the atypical heavy flavor production observed at the Fermilab Tevatron," Phys. Rev. D **73** (2006) 014025
- G. Apollinari, I. Fiori, P. Giromini, F. Happacher, S. Miscetti, A. Parri and F. Ptohos, "Study of sequential semileptonic decays of b hadrons produced at the Tevatron," Phys. Rev. D **72** (2005) 072002.
- Heavy flavor properties of jets produced in p anti-p interactions at $\sqrt{s}$ = 1.8 TeV.
  Nov 2003, D. Acosta *et al.*, Published in Phys. Rev. D **69** (2004) 072004
- Study of the heavy flavor content of jets produced in association with W boson in p anti-p collisions at $\sqrt{s} = 1.8$ TeV.
  Sep 2001, D. Acosta *et al.*, Published in Phys. Rev. D **65** (2002) 052007
- Measurement of the t anti-t production cross-section in p anti-p collisions at $\sqrt{s} = 1.8$ TeV.
  Jan 2001, T. Affolder *et al.*, Published in Phys. Rev. D **64** (2001) 032002.

Internal CDF Publications

1. CDF9230, PRD DRAFT: Study of multi-muon events produced in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV - 20/10/08;
2. CDF8733: Measurement of the correlated $b\bar{b}$ production - 11/6/07;
3. CDF8394: Measurement of the B+ production cross section at $\sqrt{s}$=1.96 TeV - 21/7/06;
4. CDF8507: Tuning of herwig version 6.5 - 25/9/06;
5. CDF7543, NIM Draft: Determination of the jet Energy scale at the Collider Detector at Fermilab - 11/7/05;
6. CDF7599: Cross-check of the CHA and WHA calibrations - 26/4/05;
7. CDF6891: Energy scale calibration of CDF Hadron Calorimeters - 23/2/04;
8. PRD draft: Study of the semileptonic decays of b hadrons produced at Tevatron - 2003;
9. PRD draft: Search for narrow resonances below the Υ mesons - 2003;

10. PRD draft: A possible explanation for the anomalous heavy flavor production observed at Tevatron - 2003;

11. CDF5856: Timing calibration of CDF hadron calorimeters - 14/2/02;

12. CDF4795: Observation of semileptonic decays of heavy quarks produced in $p\bar{p}$ interactions and the existence of one scalar quark - 29/3/2000;

13. CDF4257: Measurement of the data to simulation scale factor for the tagging efficiency of SECVTX and JPB - 28/3/99;

14. CDF4303: Method II measurement of the top cross section with W+3,4 jet events with SECVTX, JPB and SLT tags - 26/3/99;

15. CDF4860: Measurement of the dimuon invariant mass between the Psi and the Upsilon - 25/1/1999;

16. CDF4115: Heavy flavor content of jets in the data and in Herwig simulations - 19/3/97;

17. CDF3855: Measurement of the $t\bar{t}$ production cross section using SECVTX tags - 11/2/97;

18. CDF3861: Measurement of the $t\bar{t}$ production cross section using SLT tags - 4/9/96;

19. CDF3876: Measurement of the $t\bar{t}$ production cross section using Jetprobability tags - 11/9/96;

20. CDF3485: Evidence for a b-bbar state of mass 109 GeV - 17/1/96;

21. CDF3457: ZZJSCO: jet corrections for the study of ttbar, VV and VH production - 19/12/96;

22. CDF3602: Study of the top invariant mass distribution using $W+ \geq 4$ jet events - 11/3/96;

23. CDF3610: Study of the invariant mass distribution of the two highest E_t jets in $V+ \geq 2$ jet events with a SECVTX tag - 15/3/96.

Publications of Fabio Happacher

1. T. Aaltonen *et al.* [CDF Collaboration], "Search for Maximal Flavor Violating Scalars in Same-Charge Lepton Pairs in $p\bar{p}$ Collisions at $\sqrt{s} = 1.96$ TeV," arXiv:0809.4903 [hep-ex].

2. T. Aaltonen *et al.* [CDF Collaboration], "The first measurement of the top quark mass at CDF II in the lepton+jets and dilepton channels simultaneously," arXiv:0809.4808 [hep-ex].

3. T. Aaltonen *et al.* [CDF Collaboration], "Search for a Higgs Boson Decaying to Two W Bosons at CDF," arXiv:0809.3930 [hep-ex].

4. T. Aaltonen *et al.* [CDF Collaboration], "Measurement of the Single Top Quark Production Cross Section at CDF," arXiv:0809.2581 [hep-ex].

5. T. Aaltonen *et al.* [CDF Collaboration], "Search for Supersymmetry in pp-bar Collisions at sqrt(s)=1.96 TeV Using the Trilepton Signature of Chargino-Neutralino Production," arXiv:0808.2446 [hep-ex].

6. T. Aaltonen *et al.* [CDF Collaboration], "First Direct Bound on the Total Width of the Top Quark in ppbar Collisions at sqrt(s) = 1.96 TeV," arXiv:0808.2167 [hep-ex].

7. T. Aaltonen *et al.* [The CDF Collaboration], "Search for Doubly Charged Higgs Bosons with Lepton-Flavor-Violating Decays involving Tau Leptons," arXiv:0808.2161 [hep-ex].

8. T. Aaltonen *et al.* [CDF Collaboration], "Measurement of the top quark mass with dilepton events selected using neuroevolution at CDF," arXiv:0807.4652 [hep-ex].

9. T. Aaltonen *et al.* [CDF Collaboration], "Search for the Higgs boson produced with $Z \to \ell^+\ell^-$ in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV," arXiv:0807.4493 [hep-ex].

10. T. Aaltonen *et al.* [CDF Collaboration], "Measurement of the fraction of t-tbar production via gluon-gluon fusion in p-pbar collisions at sqrt(s)=1.96 TeV," arXiv:0807.4262 [hep-ex].

11. T. Aaltonen *et al.* [CDF Collaboration], "Search for large extra dimensions in final states containing one photon or jet and large missing transverse energy produced in p-pbar collisions at sqrt(s) = 1.96 TeV," arXiv:0807.3132 [hep-ex].

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