

Curriculum vitae et studiorum

Monica Turcato

Personal information

First and last name: Monica Turcato

Place of birth: Schio (VI), Italy

Date of birth: September 5, 1975

Citizenship: Italian

Marital status: Married, 1 child

Language skills: Italian (mother tongue), English (fluent), German (intermediate)

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Current position

Post-doc at the Institute for experimental Physics of the University of Hamburg, since March 2007. On maternity leave from May 2010 to June 2011.

Education

PhD in Physics, Padova University. Thesis title: “*Measurement of beauty photoproduction at HERA*”. Thesis defended on February 17, 2003. Adviser Prof. Riccardo Brugnera.

Laurea degree with full marks and honours (110/110 *cum laude*) in Physics, Padova University. Thesis title: “*Produzione di open beauty ad HERA*” (*Open beauty production at HERA*). Thesis defended on July 20, 1999. Advisers Prof. Cesare Voci and Prof. Riccardo Brugnera.

Maturità Scientifica (high school scientific degree), Liceo Scientifico “N. Tron”, Schio (VI), 1994. Final marks: 60/60.

Research activities

Summary

After a period as summer student at Fermilab, I did my diploma and PhD at Padova University, working for the ZEUS experiment. I participated to the **commissioning of the ZEUS microvertex detector (MVD)** which was installed in 2000 [1, 2]. I contributed to the running of the experiment as a **component expert**, for the barrel and rear muon chambers. I worked to the determination of the trigger and reconstruction efficiency of the muon detectors. The topic of my PhD thesis was the **measurement of beauty production in the photoproduction regime** [3].

I got my PhD at the end of February 2003 and started working as a post-doc in Padova for the ZEUS experiment. I completed the analysis which was the subject of my thesis, that was published at the end of 2003 [4]. I was then involved in several activities, related to data taking, software and analysis. In 2003-2004 I was the **code manager of the Monte Carlo software** of the ZEUS experiment. I was then, for one year between 2004 and 2005, the **trigger representative** for the heavy flavour physics group, and I participated to the redesign of the trigger slots needed to adequate the rates to the increased luminosity provided by the HERA accelerator. Between 2005 and 2006 I was one of the **run coordinators** of ZEUS, and at the end of 2006 I became one of the **convener of the heavy flavour physics group**. From 2006 to the end of 2008 I contributed to the **alignment of the microvertex detector**, determining the alignment parameters that were used in 2008 for the final processing of the data. Between 2007 and 2008 I also contributed to the **calibration of a small electron calorimeter**, the 6m-tagger, located very close to the beam pipe, which was used for the determination of the photoproduction background in the measurement of the longitudinal structure function of the proton, F_L [5], and for the measurement of the total photoproduction cross sections [6].

I completed an analysis of beyond the standard model physics [7], on the **search of multi-lepton events at high transverse momenta**. These results were combined with those obtained by the H1 collaboration, presented as preliminary at the DIS 2009 conference, and then published as the **first common H1 and ZEUS paper** [8] in 2009.

From spring 2009 to April 2010 I was one of the **physics chairpersons** of the ZEUS experiment and the ZEUS contact person for the ZEUS and H1 combined activities.

After my maternity leave (May 2010 to June 2011) I have restarted my work for the ZEUS experiment as **convener of the QCD physics group**.

A more detailed description of my activities can be found below.

Summer 1998

Summer student at Fermilab, work on silicon sensors for the CDF vertex detector.

Fall 1998 – July 1999

Work for the diploma thesis at Padova University, partly at DESY. Thesis title: "*Produzione di open beauty ad HERA*" (*Open beauty production at HERA*), defended on July 20, 1999.

August – September 1999

Work at DESY on the beam tests of the silicon wafers for the ZEUS microvertex detector [1].

Fall 1999 – February 2003

PhD with Padova University, partly at DESY, working for the ZEUS experiment:

- expert of the ZEUS barrel and rear muon detectors (B/RMUON);
- commissioning of the ZEUS vertex detector (MVD) [2];
- test beam for the OPERA experiment [9];
- analysis of the ZEUS data on beauty production in the photoproduction regime, finalised in the PhD Thesis [3] defended on February 17, 2003.

March 2003 – February 2007

Post-doc at Padova University, partly at DESY, working for the ZEUS experiment:

- finalisation of the PhD analysis into a paper [4].
- B/RMUON component expert;
- supervision of summer and diploma students;
- Monte Carlo code manager of ZEUS (2003-2004);
- development of the ZEUS event display (ZeVis);
- trigger contact person of the heavy flavour physics group (2004-2005). Redesign of the second level trigger of the group to adapt to higher luminosity and rates;
- development of an algorithm using the vertex detector information at the third level trigger of ZEUS (2005-2006) and design of the trigger slots;
- data-taking shifts as deputy and as shiftleader;
- run coordinator of ZEUS (middle 2005 to middle 2006);
- participation to the editorial boards for paper discussion and approval;
- work on the alignment of the ZEUS vertex detector (started middle 2006);

- heavy flavour physics group coordination (started in September 2006).

March 2007 – April 2010

Post-doc at Hamburg University:

- coordination of a group of students working on the calibration of the ZEUS $6m$ tagger, a small electromagnetic calorimeter used for the measurement of the longitudinal structure function of the proton, F_L [5], and of the total photoproduction cross section [6];
- heavy flavour physics group coordination, mainly dealing with tracking- and lifetime-based analyses;
- alignment of the ZEUS vertex detector (finalised in fall 2008 for the “grand reprocessing” of the ZEUS data);
- convener of the Heavy Flavour working group session at the 16th International Workshop on Deep Inelastic Scattering, (DIS 2008);
- data analysis on beyond the SM physics, search for events with high- p_T multi-leptons [7]; finalisation of the first H1 and ZEUS combined paper [8].
- ZEUS contact person for the H1 and ZEUS combined activities (spring 2009-April 2010);
- ZEUS physics chairperson (spring 2009-April 2010).

May 2010 – May 2011

Maternity leave.

June 2011 – now

Post-doc at Hamburg University:

- ZEUS QCD physics group coordination.

Teaching and student supervision

- Laboratory assistant (25 hours) for the course of General Physics II, in the academic years 2002-2003 and 2003-2004, for a total of 50 hours.
- Laboratory assistant (25 hours) for the course of General Physics I, in the academic year 2004-2005.
- *Übungen zur Physik II und Einführung in die theoretische Physik II* (Exercises of Physics II and Introduction to Theoretical Physics II), Leader of one of the exercise group (in English), Summer Semester 2009.
- *Übungen zur Physik I und Einführung in die theoretische Physik I* (Exercises of Physics I and

Introduction to Theoretical Physics I), Leader of one of the exercise group (in English), Winter Semester 2009-10.

From June 2006 to March 2007 I co-supervised the Padova University student Ivan Marchesini, working on the analysis of di-muon production at ZEUS, for his laurea degree. Thesis title: *Di-muon production in ep collisions at HERA*. Adviser was Prof. Riccardo Brugnera. Final mark: 107/110.

From May 2007 to April 2008 I co-supervised the Hamburg University diploma student Matthias Schröder, working on the calibration of the 6m-tagger detector at ZEUS. Thesis title: *Calibration of the ZEUS 6m Tagger*.

As a postdoc, as physics group coordinator in Padova and then in Hamburg and as physics chair I had the opportunity to take care of, follow and coordinate the work of several students - summer students, diploma and PhD students - working for the ZEUS collaboration.

Conference talks

LXXXVI Congresso Nazionale SIF, Palermo, Italy (*LXXXVI Meeting of the Italian Physical Society*), *Ricerca di eventi con leptoni ad alto momento trasverso e momento mancante ad HERA* (Search for events with high- p_T leptons and high missing momentum at HERA), October 2000.

International Conference on the Structure and Interactions of the Photon and 14th International Workshop on Photon-Photon Collisions (Photon 2001), Ascona, Switzerland, *Bottom production at HERA*, September 2001 [10].

10th International Workshop on Deep Inelastic Scattering (DIS 2002), Cracow, Poland, *Beauty Photoproduction*, May 2002 [11].

12th International Workshop on Deep Inelastic Scattering (DIS 2004), Štrbské Pleso, Slovakia, *Beauty Photoproduction with ZEUS*, April 2004 [12]

International Workshop, e^+e^- collisions from ϕ to ψ , Novosibirsk, Russia, *Lepton Flavour Violation and Charmonium Physics at HERA*, February 2006 [13].

HERA and the LHC: 3rd Workshop on the implications of HERA for LHC physics, DESY, Hamburg, Germany, *Recent Heavy Flavour results from HERA*, March 2007 [14].

Europhysics Conference on High Energy Physics, EPS HEP 2007, Manchester, UK, *$F_2^{c\bar{c}}$ measurement at HERA*, July 2007 [15].

16th International Workshop on Deep Inelastic Scattering (DIS 2008), London, UK, *Summary of the Heavy Flavour Working Group*, April 2008 [16].

34th International Conference on High Energy Physics, ICHEP 2008, Philadelphia, PA, USA, *Search for isolated leptons with missing p_T and multi leptons at HERA*, August 2008 [17].

17th International Workshop on Deep Inelastic Scattering (DIS 2009), Madrid, Spain, *Multi-lepton production at HERA*, April 2009 [18].

74. Annual Meeting and DPG Spring Meeting (DPG 2010), Bonn, Germany, *Experimental tests of QCD*, invited plenary talk, March 2010.

18th International Workshop on Deep Inelastic Scattering (DIS 2010), Florence, Italy, *Recent results from the ZEUS experiment*, plenary talk, April 2010 [19].

Incontri di Fisica delle Alte Energie (IFAE 2011), *Recent results from HERA and their impact on the LHC physics*, Perugia, Italy, invited plenary talk, April 2011.

Other public talks

DESY student seminar, *Beauty cross section from $b \rightarrow \mu$ photoproduction*, DESY, Hamburg, May 2001.

Giornata di studio: produzione di charm e beauty in esperimenti rappresentati nella sezione INFN di Padova (Day of study: charm and beauty production in experiments in which INFN-Padova is involved), Physics Department, Padova, Italy, *Open beauty production at ZEUS*, May 2004. Available under: <http://alice.pd.infn.it/cbDay/turcato.pdf>.

DESY seminar, *Sneak preview of the ZEUS results for the EPS-HEP 2007 Conference*, DESY, Hamburg, July 2007.

Available under: http://www.desy.de/f/seminar/epsresults_zeus_2007.pdf.

Annual SFB and GrK Meeting, *Strong interactions and new physics at the LHC*, Hamburger Sternwarte, Bergedorf, March 2009.

67. DESY Physics Research Committee, *H1+ZEUS combined results*, DESY, Hamburg, May 2009.

Seminar at Bologna University, *Recent results from ZEUS and their impact on the LHC physics*, Bologna, Italy, April 2011.

Attended Schools and Courses

I attended the **LNF Spring School in Nuclear, Subnuclear and Astroparticle Physics**, Frascati, Italy, May 15-21, 2000.

I attended the **CTEQ Summer School on QCD Analysis and Phenomenology** , St. Andrews, Scotland, June 17-26, 2001. The school illustrated the basic and recent developments of Quantum Chromodynamics, from the theoretical as well as the experimental point of view.

I attended the **Italo-Hellenic School of Physics**, Martignano, Italy, 9-14 June 2005. The aim of the school was to illustrate the future prospects of the Physics at the LHC, from the experimental and theoretical point of view.

During the PhD I attended the following courses and passed the final exams:

Fisica Underground (Underground Physics), *Fisica Nucleare* (Nuclear Physics), *Verifiche sperimentali del Modello Standard* (Experimental tests of the Standard Model), *Metodi sperimentali della Fisica Subnucleare* (Experimental methods in high energy Physics).

Computing skills

Operating systems: Linux, Windows, MacOS.

Languages: Fortran77, C/C++, html, latex.

Data analysis: paw, root.

Publications

The total number of my publications is **144**.

Hamburg, 29th June 2011

Monica Turcato

References

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- [4] S. Chekanov et al. Bottom photoproduction measured using decays into muons in dijet events in ep collisions at $\sqrt{s} = 318$ GeV. *Phys. Rev.*, D70:012008, 2004.
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- [6] H. Abramowicz et al. Measurement of the Energy Dependence of the Total Photon-Proton Cross Section at HERA. *Phys. Lett. B*, 697:184, 2011.
- [7] S. Chekanov et al. Multi-lepton production at high transverse momentum at HERA. *Phys. Lett.*, B680:13–23, 2009.
- [8] F. D. Aaron et al. Multi-leptons with high transverse momentum at HERA. *JHEP*, 0910:013, 2009.
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- [11] M. Turcato. Beauty photoproduction. Prepared for the 10th International Workshop on Deep Inelastic Scattering (DIS 2002), Cracow, Poland, 30 April-4 May, 2002. *Acta Phys. Polon.*, B33:3195–3200, 2002.
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- [13] M. Turcato. Lepton flavour violation and charmonium physics at HERA. Prepared for the International Workshop, e^+e^- collisions from ϕ to ψ , Novosibirsk, Russia, 27 February-March 2, 2006. *Nucl. Phys. Proc. Suppl.*, 162:283–287, 2006.
- [14] H. Jung et al. Proceedings of the workshop: HERA and the LHC workshop series on the implications of HERA for LHC physics, e-Print: arXiv:0903.3861.
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- [18] M. Turcato. Multi-lepton production at HERA. Prepared for the 17th International Workshop on Deep-Inelastic Scattering and Related Subjects (DIS 2009), Madrid, Spain, April 2009, doi:10.3360/dis.2009.60.
- [19] M. Turcato. Recent results from the ZEUS experiment. Prepared for the 18th International Workshop on Deep-Inelastic Scattering and Related Subjects (DIS 2010), Florence, Italy, April 2010, PoS(DIS 2010)001.