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**MARCELLO BINDI
CURRICULUM VITAE**

INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)

COGNOME	BINDI
NOME	MARCELLO
DATA DI NASCITA	12/01/1981

**INSERIRE IL PROPRIO CURRICULUM
(non eccedente le 30 pagine)**

Marcello Bindi

DOB: 12/01/1981
Nationality: Italian
Gender: Male

+ 41 (0) 75411 7045 (CH)
CERN Bat.1/R-025,
CH-1211 Genève 23,
Switzerland
Marcello.Bindi@cern.ch

+ 49 551 39 7657 (DE)
II. Physikalisches
Institut, Friedrich-Hund-
Platz 1, 37077
Göttingen, Germany
Marcello.Bindi@phys.uni-goettingen.de

EDUCATION

- 2005 – 2008 Ph.D. Degree in Physics, (best note), University of Bologna, Italy.
Title: “Measurement of charm and beauty production in deep Inelastic scattering at HERA using semi-leptonic decays into muons”
- 1999 – 2004 M. Sc. Degree in Physics, (magna cum laude),
University of Bologna, Italy.
Title: “Study of beauty jet shape in ep collision at HERA”,

RECENT EMPLOYMENTS/FELLOWSHIPS

- Dec. 2013 - present **“Research Assistant”**, University of Göttingen,
ATLAS Experiment, CERN, Geneva, Switzerland.
- Nov 2014 – Nov 2017 **“CERN Project Associate”** – PH- ADE –ID group
- Dec. 2008 - Dec 2013 **“Postdoctoral fellowship”**, National Institute of
Nuclear Physics (INFN) and University of Bologna,
ATLAS Experiment, CERN, Geneva, Switzerland.
- Sep. 2009 **Qualified Researcher**, I.N.F.N., Italy
- Sept. 2008 - Aug 2009 **“CERN-INFN Scientific Associate”**, PH-ADE-MU
group, ATLAS experiment, CERN, Geneva, Switzerland.

RESEARCH ACTIVITIES

ATLAS Experiment, C.E.R.N., Geneva, CH.

Sept. 2008 – present

Pixel Deputy Project Leader

(March 2018 - present)

In March 2018, I was nominated Pixel Deputy Project Leader.

My responsibilities at CERN as Pixel Deputy Project Leader are:

- Supervise the Pixel detector operation and performance, assuring a good communication and collaboration between the different working groups (DCS, DAQ, DQ, Calibration and Performance, Offline and Radiation Damage).
- Make sure that the Pixel detector efficiency is high and stable, keeping in mind also the long-term stability, in particular for what concerns radiation damage effects and other ageing issues.
- Define priorities and set up investigations needed to cope with problems appeared during the Pixel operation. Examples of such activities are running a detailed analysis on a series of HW failures or setting up a special taskforce to overcome readout bandwidth and/or power system limitations.
- As member of the Pixel Steering group, I had to take decisions regarding the manpower involvement in the relevant Pixel working groups.
- Review the quality of all the Pixel communications (talks, proceedings, publication notes, papers).
- Review the Operation Task Planner (OTP) for the Pixel collaboration, assuring that a fair credit is given for the service work of the members of the Pixel collaboration.
- Guide the contribution of many Pixel post-docs, Ph.D. and master students.

Pixel High Luminosity Task Force Coordinator

(November 2016 – February 2018)

In November 2016, the Pixel group created a new taskforce in order to prepare the Pixel detector for future operation at very high Luminosity (up to $3 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$).

My responsibilities at CERN as Coordinator of the taskforce were:

- Steer the process of understanding all possible limitations coming from the detector and/or the read-out system in the high luminosity scenario.
- Propose possible solutions to overcome these limitations.
- Understand the impact of the propose solutions interacting with the Offline experts and requesting special simulation studies.
- Summarize the results/recommendations of the task force into an ATLAS Note by summer 2017.

Pixel Run Coordinator

(May 2016 – October 2016)

Pixel Deputy Run Coordinator

(January 2016 – April 2016)

Since January 2016, I was responsible for the Pixel detector activity regarding the readiness for 2016 data taking. Starting from May 2016, I was the Pixel Run Coordinator; during this period the Pixel detector had to face many challenges due to the outstanding performance achieved by the LHC machine.

The Pixel detector was successfully operated under conditions beyond the design values.

My responsibilities at CERN were:

- Coordinating the activities of the Pixel operation team, acting as the interface with the ATLAS Run Coordination.
- Ensuring the integrity of the detector/read-out whilst maximizing the data taking efficiency.
- Interact with different experts (Detector, DCS, Cooling, DAQ, DQ and Offline) in order to understand new issues appeared during the operation and guarantee a proper follow-up.
- Setting priority for the Operation team on a short-mid term.
- Ensuring the training of the Shift Crew and keep a daily follow-up.

***Pixel Data Acquisition (DAQ) /
Read-Out System Upgrade Coordinator***

(March 2015 – April 2016)

I have been responsible for the commissioning and integration of the read-out system of the recently installed Insertable B-Layer in 2015. At the same time I was also responsible for the operations of the rest of the Pixel read-out system.

My responsibilities at CERN were:

- Coordinating the Pixel DAQ group (~20 people), addressing the challenges of the newly installed IBL front-end electronics (FE-I4) and the read-out system. In parallel, I was also responsible for the read-out system used by the other Pixel layers that required a constant follow-up since it had to work in a more critical environment with respect to the RUN1 period.
- Member of the analysis team for the ATLAS Pub note “Radiation induced effects in the ATLAS Insertable B-Layer readout chip”.
<https://cds.cern.ch/record/2291800/files/ATL-INDET-PUB-2017-001.pdf>
- Ensuring the integrity of the hardware components (Server PCs - VME Crates - Read Out Electronic Boards – Optical Links/Plugins - Front-End chip) whilst maximizing the data taking efficiency.
- Leading the FW/SW developments needed by the data taking operation, giving priority to the most critical items without losing the longer-term picture.
- Since November 2015, I coordinated the upgrade of the read-out system of two Pixel detector layers that has been installed during the 2015/2016 winter shutdown.

***System-test Coordinator & FW/SW developer
for the Insertable B-Layer (IBL) pixel detector***

(2013 till 2015)

Since 2012, I have been working on the Phase-0 upgrade of the Pixel detector for the ATLAS experiment at CERN. IBL main purpose is to improve tracking, vertexing and b-tagging for high pileup, and recovers performances spoiled by possible failures in present Pixel detector.

My responsibilities at CERN were:

- Coordinating the system tests of the new IBL Read-Out system in the CERN labs.

- Validating the integration between the software and the hardware components, starting from establishing both optical/electrical connections to the new Front-end chip (named FE-I4).
- Validating the FE-I4 configuration using the new read-out electronic cards and defining the calibration/testing software requirements.
- Defining the needed firmware developments with the collaboration of the relevant experts.
- Developing and maintaining the VHDL firmware/embedded software to access the FE-I4 through the FPGAs installed on the Read-Out-Driver (ROD) card (handling configurations, managing trigger and running calibration procedures).
- Validating the hardware requirements for the new IBL Off-detector electronic boards. I was responsible for the test results during the Read-Out electronics Production Readiness Review (PRR)

Detector Control System (DCS) Expert

(2008 till 2012)

Data Quality Coordinator for the Resistive Plate Chambers (RPC) project.

(2011 till 2012)

At the start of LHC activity, I joined the ATLAS experiment working on the RPC detector. It consists of about 7000 m² of gas detector equipped with about 4×10^5 electronic channels, that ensures the Level1 muon trigger and the second coordinate measurements for the muon tracks.

My responsibilities at CERN were:

1. Responsible for the DCS of the RPC.
2. Detector expert. My support and coordination of the detector maintenance during the LHC run allowed having a stable active detector fraction during 2010-2012 data taking. My work on the stability of the RPC working point permitted the optimization of the RPC trigger and detector efficiency.
3. Physics analysis on the Cavern background and Online Luminosity measurements.
4. Coordinator of the RPC Data Quality, in charge of ensuring a proper follow-up of the problems occurred in the detector or at the trigger level.

More in details:

DCS Software packages development (programs written in C/PVSS) and writing of its documentation:

- *RPC Configuration Database (ConfDB)*: software to configure the detector for Calibration purposes, allowing for cosmic runs, High Voltages scan and Front-End thresholds scan.
- *RPC Conditions Database (CondDB)*: software to store the detector conditions in the ATLAS conditions database (COOL). The detector conditions used two different granularities:
 - trigger tower, used by the ATLAS Data Quality to tag the detector conditions per run,
 - read-out panel, used for detector efficiency studies and the determination of the active detector fraction.
- *RPC Working Point Optimization*: software to apply an automatic on-line correction of the RPC HV settings in order to increase, stabilize and make uniform the detector efficiency. The successful evaluation and implementation of the working point correction, has significantly improved the efficiency of the RPC and stabilised their performance during 2011/12 data taking.

Hardware and Operations:

- Responsible for the maintenance operations at point 1, defining actions to be taken to solve any hardware issue occurred in the detector.
- Coordinator of the work of technicians during LHC technical stops and the long shutdown.
- Detector expert for the installation of HV/LV cables/connectors and electronics boards, and for the testing of the detector hardware and gas line tightness.

Data Quality Coordination:

- Responsible of RPC Data Quality in the ATLAS Collaboration.
- Responsible for the monitoring of the detector, in charge of defining the schedule for the technical and scientific activities.

- Acting as interface among DCS, Online and Offline, defining possible issues and ensuring the follow-up through the coordination of experts/shifters.

Physics Analysis (results have been published by Journal of Instrumentation (JINST).

<https://iopscience.iop.org/article/10.1088/1748-0221/8/02/P02020>:

- I was one of the three authors of the Cavern background studies (2D map and activation measurements) that gave an estimation of the cavern background in ATLAS and has used to extrapolate the results to higher luminosities.
- I was one of the main authors of the Online Luminosity measurements studies. Since 2012, RPC are publishing their official Luminosity measurement, reporting the results to the Luminosity Task Force group.

Shifts and expert on-call duties:

- RPC expert-on call as DCS/Detector expert-on-call.
- Responsible for the training of the “MUON Shifters”.
- **ATLAS shift leader:** since the beginning of 2010 I have been covering many shifts in the Atlas Control Room, coordinating and leading the data taking activity and a group of almost 10 shifters.

ZEUS experiment, D.E.S.Y., Hamburg, DE.

2004-2008

I’ve been working for the ZEUS experiment at the HERA collider in Hamburg (Germany) on the data analysis and the hardware/software maintenance of the Forward Muon spectrometer (FMUON).

My Main responsibilities at DESY were:

- Physics analysis (this work was partially performed at the Universidad Autonoma de Madrid, Spain)
 - First measurement of Beauty jet shape at HERA - I studied the different algorithms of jet reconstruction and I used the jet shape as discriminating variable to extract the beauty quark component from a sample of photo-production events.
 - Tracking code developments - I simulated the dead material of the silicon Micro Vertex Detector (MVD) via the reconstruction of secondary vertices coming from both photon conversions and hadronic interactions. The difference I found between data and Monte Carlo was used to correct and improve the detector simulation in the following releases.
 - Heavy Flavor studies - The goal of this analysis was the measurement of the differential cross sections of the processes $e+p \rightarrow e + cc + X$ and $e+p \rightarrow e + bb + X$ in deep inelastic scattering events, exploiting the semi-leptonic decay of the heavy flavored quarks to muons. The differential cross sections were then compared to next-to-leading order QCD predictions. The heavy quarks contributions to the proton structure function F_2 , F_2^{cc} and F_2^{bb} , were extracted and compared with theoretical predictions using different parameterizations of the proton PDFs. The results of this work (my Ph.D. analysis) have been published in Eur. Phys. J. C65 (2010) 65-79.
- Hardware maintenance responsibilities and shift duties:
 - Responsible for the monitoring of FMUON: my main activities were related to DAQ, Data Quality Monitor and slow control. I was the FMUON on-call expert.
 - Deputy shift leader in 2005 for ZEUS experiment.
 - Shift leader in 2006 and 2007 for ZEUS experiment.

PERSONAL SKILLS AND COMPETENCES

Languages:

Italian Mother Tongue, **English** Fluent, **Spanish** Fluent, **French** Very Good, **German** Good

Computer knowledge:

- Operating Systems: GNU/LINUX, MAC OS X, Windows 98/2000/XP.
- Computer Languages: Fortran, C/C++, bash scripting, HTML, VHDL, Python
- Word Processing: Microsoft Word, Open Office LINUX, Pages OS X
- Scientific Appl.: Paw, ROOT, Mat Lab, PVSS
- VHDL firmware: ISE Xilinx, Xilinx Chipscope Debug, Impact programmer.

Social (or soft) skills and competences:

- *Team Work*
I like to work in groups motivating the others and myself to obtain the maximum results. I am capable of an independent and imaginative research. I am willing in taking responsibility of my assigned project. I have experience in working in small groups up to very big groups in an international environment as DESY and CERN laboratories.
- *Communication and Teaching skills*
I'm an effective communicator in presenting work and projects at internal meetings, workshops and international conferences. I was Teaching Assistant in the Laboratory courses at the Physics Department and a student mentor and representative. I taught many students and post-docs with different levels of training (shifter, expert,). I am a CERN official guide.
- *Time management*
I have ability to prioritize and manage time effectively to keep the schedule. I know how to set priorities and deadlines to achieve the goals.
- *Mediating skills*
As Data Quality and detector maintenance coordinator for the RPC and as DAQ/RUN coordinator for the Pixel detector, I had to face and address different requests coming at the same time from different teams. I am flexible and inclined to mediation when it will not affect the results or the schedules.
- *Intercultural skills*
I have lived in different countries (Italy, Spain, Germany and Switzerland) exchanging and enriching my knowledge by the interactions of different cultures.
- *Working under stress*
I work at CERN since 2008 and I faced different working situation at the same time, developing code, providing support to the detector team and attending to meetings. I'm flexible to work during the weekends, during nights or whenever it's required.
- *Supervision and managerial skills*
I supervised the work of several CERN Summer Students, Ph.D. students and Post-docs coming from different Universities during my career at CERN.

I learned to lead small (<20 people) group of developers during my early career in Pixel/IBL as DAQ coordinator or team of technicians (<10 people) during my post-doc with the RPC community. More recently, my responsibilities increased and I managed a wider group of people, trying to keep a direct contact with the experts while delegating tasks to the lower level coordinators. The optimization of the group structure and the proper communication between the various team have been a priority during my last year Deputy Pixel Project Leader.

MEMBERSHIP AND AWARDS

- Member of the “Pixel Steering Committee”
- Member of the IBL Radiation Induced Effect Taskforce
- Member (Coordinator) of the Pixel High Luminosity Taskforce
- Awarded “ATLAS Outstanding Achievement” for the “Outstanding contributions to the successful commissioning and operation of the Pixel Detector for the start-up of Run 2”.

SUPERVISION AND TEACHING

- Supervision of CERN Summer students working on hardware and commissioning tests of the IBL Read Out System.
- Supervision of several Ph.D. students willing to qualify as ATLAS author and Post-doc joining the Pixel/IBL commissioning and calibration.
- Supervision of University of Goettingen masters students whilst at CERN, working on the optimization of the optical tuning of the Pixel detector with the new read out system.
- Supervision of University of Goettingen masters students whilst at CERN, working on the development of new calibration procedures for the IBL detector

SELECTED COLLOQUIUMS AND INVITED TALKS

“SEU/SET results in ATLAS IBL FE-I4B chip during Run 2 operation”, on behalf of the ATLAS Collab. , Radiation effects in the LHC experiments and impact on operation and performance, Feb 2019, CERN, Switzerland.

“Operational Experience and Performance with the ATLAS Pixel detector at the Large Hadron Collider”, on behalf of the ATLAS Collab. , ICHEP2018 “XXXIX International Conference on High Energy Physics”, Jul. 2018, Seoul, Korea.

“ATLAS Physics Prospect at High Luminosity LHC”, on behalf of the ATLAS Collab., ICNFP2017 “6th International Conference on New Frontiers in Physics”, Aug. 2017, Kolymbari, Greece.

“Lessons learned in the ATLAS Pixel IBL project”, on behalf of the ATLAS Collab., 2015 IEEE “Nuclear Science Symposium & Medical Imaging Conference”, Nov. 2015, San Diego, USA.

“Atlas RPC detector as luminosity monitor”, on behalf of the ATLAS Collab., XI workshop on Resistive Plate Chambers and Related Detector, Feb 2012, Frascati, Italy.

“Inelastic cross section measurement at LHC”, on behalf of ATLAS and CMS Collab.s, Frontiers of QCD: From Puzzles to Discoveries, Dec 2011, Qui Nhon, Vietnam.

“Performance of the ATLAS Muon Spectrometer”, on behalf of the ATLAS Collab., “Kruger 2010: Workshop on Discovery Physics at the LHC”, Dec 2010, Kruger Park, South Africa.

“ATLAS RPCs operation and performance tuning through the Detector Control System at the startup of 2009 LHC run”, on behalf of the ATLAS Muon Group, “X workshop on Resistive Plate Chambers and Related Detector”, Feb 2010, GSI, Darmstadt, Germany.

“Measurements of Charm and Beauty in DIS via muon tags at ZEUS”, on behalf of the ZEUS Collaboration, “Lepton-Photon 2009”, Aug 2009, Hamburg, Germany.

“Beauty production in DIS and the measurement of F_2^{bb} at ZEUS”, on behalf of the ZEUS Collaboration, “DIS 2009”, Apr 2009, Madrid, Spain.

“Measurement of F_2^{cc} at HERA”, on behalf of the H1 and ZEUS Collaborations, “DIS 2008”, Apr 2008, UCL, London, England.

SELECTED SEMINARS

“Operating Pixel with luminosity conditions of Run-2 and Run-3”, on behalf of the Pixel Group, ATLAS Weekly/Open EB, March 2017, CERN, Switzerland.

“ROD/BOC Achieved Test Results”, on behalf of the IBL Group, “ROD/BOC Production Readiness Review (PRR)”, July 2013, CERN, Switzerland.

“Status of ROD/BOC, RX/TX plugin and opto-package production”, on behalf of the IBL Group, “ATLAS Upgrade Week”, May 2013, CERN, Switzerland.

“ROD/BOC hardware and firmware overview”, on behalf of the IBL Group, “ATLAS Pixel Week”, Feb 2013, CERN, Switzerland.

“Understand RPC trigger: from Hits to Trigger Efficiencies”, on behalf of the RPC/LVL1 Trigger Group, “ATLAS Week”, May 2011, CERN, Switzerland.

“RPC Online and DCS Status”, on behalf of the RPC Group, “ATLAS MUON Week”, Jul 2010, CERN, Switzerland.

“ATLAS DCS Data Quality Calculation”, on behalf of the ATLAS Collaboration, “ATLAS DCS Workshop”, Jun 2010, Annecy, France.

“MUONS Future Developments / Upgrade”, on behalf of the ATLAS MUON Group, “ATLAS DCS Workshop”, Jun 2010, Annecy, France.

“Muon detectors at LHC”, invited talk at the Department of Physics, Mar 2010, Bologna, Italy.

“Charm and beauty to muons in deep inelastic scattering at HERA”, on behalf of the ZEUS Collaboration, “SIF 2008”, Sep 2008, Department of Physics, Genoa, Italy.

“Measurement of F_2^{cc} and F_2^{bb} at HERA”, M. Bindi et al, “ZEUS Collaboration Meeting”, Jul 2007, Madrid, Spain.

“Charm to muons in DIS”, M. Bindi et al., “ZEUS Collaboration Meeting”, Sep 2007, Chios, Greece.

“First look at dead material with conversions”, M. Bindi et al., “ZEUS Collaboration Meeting”, Jun 2005, DESY, Hamburg, Germany.

SELECTED PROCEEDINGS OF CONFERENCES

“Operational Experience and Performance with the ATLAS Pixel detector at the Large Hadron Collider”, ICHEP 2018. To be published in “Proceedings of science”,

“Performance, Operation and Detector Studies with the ATLAS RPC”, M. Bindi et al., published in “JINST”, XI workshop on Resistive Plate Chambers and Related Detector”, Feb 2012, Frascati, Italy.

“The ATLAS RPC detector as Luminosity monitor”, M. Bindi, published in “Proceedings of science”, XI workshop on Resistive Plate Chambers and Related Detector”, Feb 2012, Frascati, Italy.

“Operation and performance tuning of ATLAS RPCs through the Detector Control System at the startup of 2009 LHC run”, M. Bindi, published in “Nuclear Inst. and Methods in Physics Research, A (2012)”, X workshop on Resistive Plate Chambers and Related Detector”, Feb 2010, GSI, Darmstadt, Germany.

“Measurements of Charm and Beauty in DIS via muon tags at ZEUS”, M. Bindi, published in “Proceedings of XXIV International Symposium on Lepton and Photon Interactions at High Energies”, “Lepton Photon 2009”, Aug 2009, Hamburg, Germany.

“Beauty production in DIS and the measurement of F_2^{BB} at ZEUS”, M. Bindi, published in “Proceedings of the XVII International Workshop on Deep-Inelastic Scattering and Related Subjects”, “DIS 2009”, Apr 2009, Madrid, Spain.

“ F_2^{CC} measurements at HERA”, M. Bindi, Proceedings of the XVI International Workshop on Deep-Inelastic Scattering and Related Subjects, “DIS 2008”, Apr 2008, London, England.

The full list of scientific publications, which consists of 85 papers with the ZEUS experiment and 779 with the ATLAS experiment can be found here:

<http://marcellobindi.weebly.com/publications.html>

CONTACTS FOR REFERENCES

Works and educational:

Prof. Arnulf Quadt
University of Göttingen, Arnulf.Quadt@cern.ch
Post-doctoral Fellow supervisor

Prof. Antonio Zoccoli

University and INFN of Bologna, Antonio.Zoccoli@bo.infn.it
Post-doctoral Fellow supervisor

Dr. Massimo Corradi
INFN of Bologna, Massimo.Corradi@bo.infn.it
Master and PhD Thesis supervisor

**Detector expert and Read-Out system expert
(Development, maintenance and coordination):**

Dr. Didier Ferrere (for the Pixel/IBL detector)
University of Geneva, didier.ferrere@cern.ch
ATLAS Pixel Project Leader between 2014 and 2018.

Prof. Rinaldo Santonico (for the RPC detector)
University of Roma "Tor Vergata", rinaldo.santonico@roma2.infn.it
ATLAS RPC Project Leader till 2014.

**Detector Control System
(development, maintenance)**

Dr. Alessandro Polini
INFN Bologna, Alessandro.Polini@bo.infn.it
ATLAS Run Coordinator between 2014 and 2016.

Data

18/07/19

Luogo

Ginevra