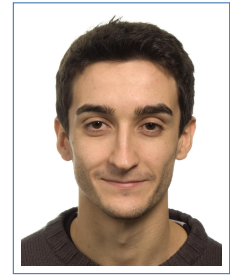


Andrea Contu

INFN, Sezione di Cagliari
Cittadella Universitaria di Monserrato
S.P. per Sestu, Km 0.700
09042 Monserrato, Italy
☎ +393495950939
☎ +39 070 675 4982 (INFN)
+41 22 76 74795 (CERN)
✉ andrea.contu@cern.ch
🏠 andreacontu.casadiiale.com



Personal Information

Full Name **Andrea Contu**

Place of Birth **Cagliari, Italy**

Date of Birth **4 Dec 1983**

Nationality **Italian**

Sex **Male**

Research Activity

I am currently a post-doctoral researcher at INFN, Sezione di Cagliari, working on LHCb. Since 2006, I have been involved in several key activities within the LHCb experiment.

In the following I shall give a brief, non-inclusive overview of my research activities as a member of the experiment.

As a CERN summer student in 2006, I monitored the mirror movements in one of the two LHCb Ring Imaging Cherenkov (RICH) detectors during its installation inside the LHCb cavern. Continuing this theme, in Oxford I was responsible for the calibration of the magnetic field distortion inside the photodetectors in RICH1 both on the hardware side, by maintaining the Magnetic Distortion Calibration System (MDCS), and by developing software to analyse MDCS data and provide calibration parameters to improve the RICH performance. I have also developed a web based system for monitoring performance and history of the calibration system. This is vital to the success of particle identification in LHCb since it greatly improves the Cherenkov angle resolution. A paper has been submitted to NIM-A and is currently under review.

During my PhD at University of Oxford, my primary research was focused on soft QCD, in particular on prompt hadron production ratios. These measurements are particularly interesting in the unique kinematic region covered by LHCb. They provide information on baryon number transport and hadronisation mechanisms and are a valuable input to future LHCb Monte Carlo retunings. The analysis has been developed by me as the primary contributor with collaboration from members of the Oxford LHCb group.

Results on the \bar{p}/p ratio at $\sqrt{s} = 0.9$ TeV and $\sqrt{s} = 7$ TeV have been made public and a paper, which I drafted, has recently been accepted for publication in EPJ-C. Results also include other measurements such as K^-/K^+ , π^-/π^+ , $(p+\bar{p})/(K^++K^-)$, $(p+\bar{p})/(\pi^++\pi^-)$ and $(K^++K^-)/(\pi^++\pi^-)$ ratios.

In my first year as a PhD student, I have performed exploratory Monte Carlo studies on $B^\pm \rightarrow$

$D^0(K^\pm\pi^\mp\pi^0)K^\pm$ decay modes. The high coherence factor for $D^0 \rightarrow K\pi\pi^0$ makes these modes (particularly the Cabibbo-suppressed ones) very sensitive to the CKM angle γ via tree level processes. I developed cut-based and multivariate selections, investigated decay chain fit techniques and showed that the suppressed mode may be visible in LHCb with an integrated luminosity of 1-2 fb^{-1} . I have also studied prompt $D^{*\pm} \rightarrow D^0(K^\pm\pi^\mp\pi^0)\pi^\pm$, already visible in data, for calibration purposes.

The MDCS and prompt hadron production studies form the main topics of my PhD thesis.

I have also worked on Lepton Flavour Violation in B^0 meson decays at LHCb (Master Thesis) and digital signal filtering techniques for the acoustic detection of neutrinos.

My current activity is focused on rare decays of the D^0 meson. Specifically I look for four-body decays with a pair of muons, $D^0 \rightarrow hh'\mu\mu$, where h and h' can be either a pion or a kaon. Moreover, within the LHCb Charm Working Group, I cover the role of stripping coordinator.

Interests

My interests cover mainly rare-decays and flavour physics, both in the c - and b -quark sectors. I am also interested in detector calibration and upgrade and software development.

I am open to join existing physics analysis and/or start new projects.

In the near future, I wish to increase my involvement in the above areas and particularly in the charm sector.

Education

Since May **Postdoc**, *INFN - Sezione di Cagliari*, Cagliari, Italy.

2012 Research within the LHCb experiment.

Activities:

- Rare charm decays studies
- Stripping coordinator of the LHCb Charm working group

2008–2012 **PhD Student**, *University of Oxford*, Oxford, UK.

Research within the LHCb experiment under the supervision of Prof. Neville Harnew and Prof. Guy Wilkinson.

Research topics:

- Minimum bias physics, prompt hadron production
- B physics, CKM γ measurement via tree level processes ($B \rightarrow DX$)
- Charm physics, D decays for physics and detector calibration
- Magnetic distortion calibration for the LHCb Ring Imaging CHerenkov (RICH) detectors

thesis title *The Measurement of the Production Cross Section Ratio of Identified Hadrons and the Calibration of the Magnetic Distortion in RICH1 at LHCb*

supervisors Prof. Neville Harnew, Prof. Guy Wilkinson

Jan-Aug **PhD Student**, *Università di Cagliari*, Cagliari, Italy.

2008 Research within the LHCb experiment under the supervision of Prof. Biagio Saitta.

2005–2007 **Master Degree in Physics**, *Università di Cagliari*, Cagliari, Italy, *110/110 cum laude*.

“Laurea Specialistica (Magistrale) in Fisica”: Two Years Specialistic Degree, awarded 20/11/2007.

thesis title *Study of the $B_s^0 \rightarrow \mu\tau$ decay in the LHCb experiment*

supervisor Prof. Biagio Saitta

description Feasibility study of the $B_s^0 \rightarrow \mu\tau$ lepton flavour violating decay at LHCb

- 2002–2005 **First Degree in Physics**, *Università di Cagliari*, Cagliari, Italy, *110/110 cum laude*.
 “Laurea in Fisica”: Three Years Degree, awarded 23/07/2005.
- thesis title *Software filter for the acoustic detection of ultra-high energy neutrinos in the sea*
- supervisors Prof. Biagio Saitta, Dr. Alessandro Cardini
- description Implementation of an optimal filter for discriminating acousting signals of shock waves generated by the interaction of UHE neutrinos in the sea
- 2007 **Associated Student**, *INFN*, Cagliari, Italy.
- 2006 **CERN Summer Student**, *European Organization for Nuclear Research (CERN)*, Geneva, Switzerland.
 Research project on a new system to monitor mirrors displacements for the LHCb RICH2. Under the supervision of Dr. Carmelo d’Ambrosio, LHCb, RICH group.

Awards and Fellowships

- 2003–2007 **ERSU Scholarship**, *Ente Regionale per il diritto allo Studio Universitario*.
- 2005 **Best Graduation Prize**, *Ente Regionale per il diritto allo Studio Universitario*.
- 2007 **Best Graduation Prize**, *Ente Regionale per il diritto allo Studio Universitario*.
- 2008–2011 **Master and Back Programme**, *Regione Autonoma della Sardegna*.
 Three years scholarship for PhD at University of Oxford

Physics Schools

- 16-27 Aug 2010 Participant at the 5th CERN-Fermilab Hadron Collider Physics Summer School, Fermilab
- 1-12 Sep 2009 Participant at the RAL High Energy Physics Summer School 2009, Somerville College, Oxford
- 5-9 Jun 2008 Participant at “5° Seminario Nazionale sul Software della Fisica Nucleare, Subnucleare e Applicata”, Alghero, Italy

Teaching

- 2010–2011 Marker for the Particle Physics Classes at University of Oxford
- 2008 Co-tutored 2 first degree theses titled “Kinematic techniques for the identification of rare B_S^0 decays at LHCb” and “New criteria for the selection of the $B_0 \rightarrow K^* \mu^+ \mu^-$ decay in LHCb”

Conference Talks

- 6 Dec 2010 **Kruger 2010 - Workshop on Discovery Physics at LHC**, *Kruger Park, South Africa*.
 Particle Production Multiplicities at LHCb, LHCb-TALK-2010-183
- 5 Apr 2011 **Nuclear and Particle Physics Divisional Conference 2011**, *University of Glasgow, UK*.
 Prompt Hadron Production at LHCb
- 23 Aug 2011 **QCD@LHC 2011**, *St Andrews, Scotland, UK*.
 Soft-QCD measurements at LHCb, LHCb-TALK-2011-173
- 12 Jun 2012 **ICFP 2012**, *Kolymbari, Crete, Greece*.
 Production and Spectroscopy at LHCb, LHCb-TALK-2012-154

Publications, Public Notes and Conference Proceedings

- [1] A. Contu *et al.*, CERN-LHCb-CONF-2010-009 (2010).
- [2] A. Borgia *et al.*, 1206.0253, Submitted to NIM A.
- [3] LHCb collaboration, R. Aaij *et al.*, 1210.6750.
- [4] The LHCb collaboration, R. Aaij *et al.*, 1210.6289.
- [5] LHCb collaboration, R. Aaij *et al.*, 1210.4492.
- [6] LHCb collaboration, R. Aaij *et al.*, 1210.4112.
- [7] LHCb Collaboration, R. Aaij *et al.*, 1210.2645.
- [8] LHCb Collaboration, R. Aaij *et al.*, 1210.2631.
- [9] LHCb collaboration, R. Aaij *et al.*, 1210.1089.
- [10] LHCb collaboration, R. Aaij *et al.*, 1209.5869.
- [11] LHCb collaboration, R. Aaij *et al.*, 1209.5634.
- [12] LHCb collaboration, R. Aaij *et al.*, 1209.4284.
- [13] LHCb collaboration, R. Aaij *et al.*, 1209.4029.
- [14] LHCb collaboration, R. Aaij *et al.*, Nucl.Phys. B867, 1 (2013), [1209.0313].
- [15] LHCb collaboration, R. Aaij *et al.*, 1209.0282.
- [16] LHCb collaboration, R. Aaij *et al.*, Phys. Rev. D 86, 071102, (2012) (R), [1208.0738].
- [17] LHCb collaboration, R. Aaij *et al.*, 1207.6016.
- [18] LHCb collaboration, R. Aaij *et al.*, Phys.Lett. B716, 393 (2012), [1207.5993].
- [19] LHCb collaboration, R. Aaij *et al.*, Phys.Rev.Lett. 109, 131801 (2012), [1207.5991].
- [20] LHCb collaboration, R. Aaij *et al.*, Phys.Rev.Lett. 109, 152002 (2012), [1207.0878].
- [21] LHCb Collaboration, R. Aaij *et al.*, Eur.Phys.J. C72, 2168 (2012), [1206.5160].
- [22] LHCb collaboration, R. Aaij *et al.*, JHEP 1210, 037 (2012), [1206.2794].
- [23] A. Borgia *et al.*, 1206.0253.
- [24] LHCb collaboration, R. Aaij *et al.*, Phys. Rev. Lett. 109, 172003 (2012), [1205.3452].
- [25] LHCb Collaboration, R. Aaij *et al.*, JHEP 1207, 133 (2012), [1205.3422].
- [26] LHCb collaboration, R. Aaij *et al.*, JHEP 1206, 141 (2012), [1205.0975].
- [27] LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B713, 172 (2012), [1205.0934].
- [28] LHCb collaboration, R. Aaij *et al.*, Eur.Phys.J. C72, 2118 (2012), [1205.0918].
- [29] LHCb collaboration, R. Aaij *et al.*, Phys.Lett. B713, 186 (2012), [1205.0897].
- [30] LHCb collaboration, R. Aaij *et al.*, Phys.Lett. B713, 378 (2012), [1204.5675].

- [31] LHCb collaboration, R. Aaij *et al.*, Phys.Rev. D86, 052006 (2012), [1204.5643].
- [32] LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B713, 369 (2012), [1204.2813].
- [33] LHCb Collaboration, R. Aaij *et al.*, JHEP 1206, 058 (2012), [1204.1620].
- [34] LHCb Collaboration, R. Aaij *et al.*, 1204.1462.
- [35] LHCb Collaboration, R. Aaij *et al.*, Eur.Phys.J. C72, 2100 (2012), [1204.1258].
- [36] LHCb Collaboration, R. Aaij *et al.*, JHEP 1206, 115 (2012), [1204.1237].
- [37] LHCb collaboration, R. Aaij *et al.*, Phys.Rev.Lett. 108, 251802 (2012), [1204.0079].
- [38] LHCb collaboration, R. Aaij *et al.*, Phys.Rev.Lett. 108, 231801 (2012), [1203.4493].
- [39] LHCb collaboration, R. Aaij *et al.*, Phys.Lett. B712, 203 (2012), [1203.3662].
- [40] LHCb collaboration, R. Aaij *et al.*, Phys.Rev. D85, 091105 (2012), [1203.3592].
- [41] LHCb Collaboration, R. Aaij *et al.*, Eur.Phys.J. C72, 2025 (2012), [1202.6579].
- [42] LHCb Collaboration, R. Aaij *et al.*, Phys.Rev. D85, 112013 (2012), [1202.6267].
- [43] LHCb Collaboration, R. Aaij *et al.*, Phys.Rev.Lett. 108, 201601 (2012), [1202.6251].
- [44] LHCb Collaboration, R. Aaij *et al.*, Phys.Rev. D85, 091103 (2012), [1202.5087].
- [45] LHCb Collaboration, R. Aaij *et al.*, Eur.Phys.J. C72, 2022 (2012), [1202.4979].
- [46] LHCb Collaboration, R. Aaij *et al.*, JHEP 1204, 093 (2012), [1202.4812].
- [47] LHCb Collaboration, R. Aaij *et al.*, Phys.Rev.Lett. 108, 241801 (2012), [1202.4717].
- [48] LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B714, 215 (2012), [1202.1080].
- [49] LHCb Collaboration, R. Aaij *et al.*, 1201.5600.
- [50] LHCb Collaboration, R. Aaij *et al.*, 1201.4402.
- [51] LHCb Collaboration, R. Aaij *et al.*, 1112.5310.
- [52] LHCb Collaboration, R. Aaij *et al.*, 1112.4896.
- [53] LHCb Collaboration, R. Aaij *et al.*, 1112.4592.
- [54] LHCb Collaboration, R. Aaij *et al.*, 1112.4695.
- [55] LHCb Collaboration, R. Aaij *et al.*, 1112.4698.
- [56] LHCb Collaboration, R. Aaij *et al.*, 1112.4311.
- [57] LHCb Collaboration, R. Aaij *et al.*, 1112.3515.
- [58] LHCb Collaboration, R. Aaij *et al.*, 1112.3183.
- [59] LHCb Collaboration, R. Aaij *et al.*, 1112.1600.
- [60] LHCb Collaboration, R. Aaij *et al.*, 1112.0938.

- [61] LHCb Collaboration, R. Aaij *et al.*, 1111.4183.
- [62] The LHCb Collaboration, R. Aaij *et al.*, 1111.2357.
- [63] R. Aaij *et al.*, Phys.Lett. B707, 349 (2012), [1111.0521].
- [64] LHCb Collaboration, R. Aaij *et al.*, Phys.Rev. D84, 112008 (2011), [1110.3970].
- [65] LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B706, 32 (2011), [1110.3676].
- [66] LHCb Collaboration, A. Contu, PoS KRUGER2010, 021 (2011).
- [67] The LHCb Collaboration, R. Aaij *et al.*, JINST 7, P01010 (2012), [1110.2866].
- [68] R. Aaij *et al.*, 1110.0730.
- [69] LHCb Collaboration, R. Aaij *et al.*, Phys.Rev. D84, 092001 (2011), [1109.6831].
- [70] LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B707, 52 (2012), [1109.0963].
- [71] LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B703, 267 (2011), [1107.3935].
- [72] LHCb Collaboration, R. Aaij *et al.*, JHEP 1108, 034 (2011), [1107.0882].
- [73] LHCb Collaboration, R. Aaij *et al.*, Phys.Rev.Lett. 107, 211801 (2011), [1106.4435].
- [74] the LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B699, 330 (2011), [1103.2465].
- [75] LHCb Collaboration, R. Aaij *et al.*, Eur.Phys.J. C71, 1645 (2011), [1103.0423].
- [76] LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B698, 14 (2011), [1102.0348], Long author list - awaiting processing.
- [77] LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B698, 115 (2011), [1102.0206].
- [78] LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B694, 209 (2010), [1009.2731].
- [79] LHCb Collaboration, R. Aaij *et al.*, Phys.Lett. B693, 69 (2010), [1008.3105].
- [80] The LHCb Collaboration, B. Adeva *et al.*, 0912.4179.

Languages

Italian **Mother Tongue**

English **Fluent**

French **Fair**

Computer skills

Operative Systems Unix/Linux(Very Good), MacOS(Good), Windows(Good)

Software ROOT(Excellent), Mathematica(Good), Matlab(Good), Office suits(Good), PVSS(Fair), All Browsers

Programming and Markup Languages C/C++(Excellent), Python(Good), PHP(Good), Javascript(Very Good), HTML(Excellent), XML(Good), Bash/Tcsh(Good), T_EX(Good), Java(Basic), ASP(Basic)

Databases MySQL(Good), Oracle(Good), SQLite(Good)

Miscellaneous

Hobbies Computing, playing trumpet

Sports Football, running

Driving European, Class B

License

Referees

Dr. Walter Bonivento

INFN Cagliari

Cittadella Universitaria di Monserrato

Strada Provinciale per Sestu Km 0.700

Casella Postale 170

09042 - Monserrato (CA)

Italy

+39-070-675-4977

Walter.Bonivento@cern.ch

Prof. Guy Wilkinson (PhD Supervisor)

University of Oxford

Office 2 1-043, CERN

Geneve 23

CH-1211, Switzerland

+41 22 76 73994

Guy.Wilkinson@cern.ch